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AGENCY**

Land Use Survey



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The Youth Advisory Board's summer land use activities have attempted to develop a comprehensive overview of land use policies, practices, attitudes and mechanisms in the five state area of Region VI. The task force focused on the coastal zone of Texas and Louisiana in an effort to explain some of the environmental problems affected by land use. Pollution is frequently the direct result of improper land use management. The survey has taken a close look at existing attitudes and procedures concerning land use and its control mechanisms. Interviews and questionnaires were sent to environmental groups, professors, industries and local officials. Impacts of a representative council of government was investigated. Study includes summary of existing EPA policies and programs in Region VI. Several case studies were included.

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REGION VI LAND USE TASK FORCE
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PREPARED BY THE
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THIS REPORT DOES NOT NECESSARILY REFLECT THE VIEWS AND POLICIES OF THE
ENVIRONMENTAL PROTECTION AGENCY.

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INTRODUCTION

The Youth Advisory Board's summer land use activities have attempted to develop a comprehensive overview of land use policies, practices, attitudes and mechanisms in the five state area of Region VI. The task force focused on the coastal zone of Texas and Louisiana in an effort to explain some of the environmental problems affected by land use.

Land use management can play an important part in achieving and maintaining environmental quality. It can be used as a planning tool in implementing air, water and solid waste policies and programs. Pollution is frequently the direct result of improper land use management.

The survey in Region VI has taken a close look at existing attitudes and procedures concerning land use and its control mechanisms. Interviews and questionnaires sent to environmental groups, professors, industrial representatives and local officials helped substantiate this portion of the report.

Existing and potential impacts of a representative council of governments have been investigated, and land use oriented agencies in Texas and Louisiana have been reviewed to gain a better perspective of their programs and policies affecting land use.

The study also includes a summary of existing EPA policies and programs in Region VI having land use implications. The major programs and activities of each office that affect or have the potential to affect land use and its trends in the region were identified.

Several case studies are included to explain more fully the problems associated with channelization, reservoir creation, dredge and fill operations related to land development, and other unique problems having land use

implications.

This report recognizes that EPA does affect land use. Land use management techniques and practices may be a valuable tool in its comprehensive environmental protection program.

SUMMARY

Although the coastal zone of Region VI is small in comparison to the rest of the five state area, it is expected to become the major growth center of the future. In 1970, 3.5 million, or one out of every three, Texans and 80 percent of Louisiana's population lived in the coastal zone.

Competition for land and its uses will increase in the future. The pressures of people seeking homes, jobs and recreation could result in all the problems evident in the Northeast Corridor of the United States. It is hoped that with comprehensive planning, Region VI can avoid the mistakes of others who tried to accommodate rapid growth without adequate preparations.

Region VI EPA realizes the implications and importance of land use in environmental protection. However, the interrelationship between solid waste, air pollution, water pollution and land use is not always apparent to various individuals associated with pollution control. Land use largely determines the degree of environmental degradation of any given area, and this study attempts to give an overview of EPA's existing and potential impact on land use in Region VI.

Land use implications of the construction grants program includes abandonment of outdated facilities, designation of land for waste treatment facilities and influencing land development trends through location of facilities. While 80 percent of the regional budget is allocated to aid in the construction of wastewater facilities, fewer than 10 percent of the staff reviews applications and administers these grants.

The ability to coordinate land use and other environmental considerations in the early stages of wastewater projects seems to be a problem primarily

because the first time EPA has any knowledge of the grant request is when the application arrives in the mail. By the time the grant application has been reviewed by the state and then submitted to EPA, the site, general treatment alternatives and basic construction plan are in the final stage of formulation.

Unfortunately the EIS Review Section of the Federal Activities Branch has little interaction or involvement with the environmental appraisal and impact statement process of Construction Grants. In an attempt to improve this agency's statements and assessments, FAB has prepared an interoffice set of "Guidelines for Writing Environmental Assessments" (included in the appendix) which includes recommendations that land use be considered.

EPA is currently funding the construction of wastewater facilities larger than existing needs which may be encouraging further growth and development of cities. Additional tax burdens on citizens who must pay for additional design capacity of these facilities could encourage urban expansion. While bond elections indicate the people support measures for water pollution control, perhaps the full impact of these facilities designed for additional capacity is not realized. More strict water pollution control standards in addition to the unsteady-state of biological treatment systems' effluents may make facilities presently being planned and constructed for 30 years service obsolete before their designed life-times.

The fact that EPA wastewater facilities may be contributing to urban sprawl is apparently caused by a lack of planning on the local level and sporadic development in unincorporated areas. Many municipalities have urban planners to interface planned facilities with existing and future developments. However, EPA's policy of funding wastewater facilities in special districts generally supports unplanned growth since many of these entities have no

formal governments or planning staffs.

It was found that NEPA can be used to stop condemnation of land for EPA-funded wastewater facilities as long as present land condemnation procedures do not require the inclusion of a statement of environmental consideration. This legal tool may be used by individuals to stop or delay construction of even the best environmentally planned facility.

According to EPA guidelines, wastewater facilities are to be adequately maintained and operated for a period of three years after completion of the project. An estimated 50 percent of the inspected wastewater facilities funded in Region VI are operating below desired levels of efficiency and of these an estimated 25 percent are considered to have major problems of basic operations. This constitutes less than optimal land use and a misuse of public funds.

EPA could be doing more to interface land use and environmental protection at the state and local level. Environmental planning at the local level is often limited due to its technical nature. There is no single person or office that can lend technical assistance to local planners who wish to incorporate the environment into planning activities.

The increase in hauling toxic waste materials in Region VI can be attributed to more stringent restrictions on deep well injection, ocean dumping and effluent standards. There are more than 122 private companies engaged in the disposal of toxic materials in the five state area; there are no restrictions on where or how these materials are disposed of on private lands.

Channelization of streams, while changing the overall biological aquatic system, also elevates the land use potential along the new waterway from flood plain farming to residential and industrial development. It is

important from the standpoint of water quality planning that plans be revised after the alteration of the river and subsequent development. The system that the earlier planning was done for has changed, and the ability of the stream to assimilate waste and carry-on natural in-stream treatment has been greatly reduced.

Land use authority in Texas and Louisiana is divided among numerous state agencies. This dispersion of power has led to fragmentation of authority and incoordination of activities.

Texas Councils of Governments (COG) have the authority to do comprehensive planning for communities and regions. The Alamo Area Council of Governments (AACOG) is a typical COG which provides functional and comprehensive planning, A-95 review and comment, community services and communication. AACOG's comprehensive planning involves land use, open space, transportation, housing, health, criminal justice and comprehensive social and environmental planning.

However, AACOG must convince its member governments that regional planning is in their best interests since COGs have no implementation authority to enforce sound management of regional resources. A-95 review tries to determine the adverse environmental consequences of each project but at times "political feasibility" becomes the major issue when the executive committee--composed of mayors, county judges, etc. of member governments--makes policy decisions on land use and environmental protection.

Zoning and subdivision regulations are the primary land use control mechanism used by Texas cities and counties, but they are relatively inflexible and cannot be applied very creatively or efficiently in the regulation of large scale developments.

Fiscal zoning, building and housing codes and capital improvement programs are other types of land control, but planning commissions and departments, building and housing code officials and boards of appeal have

fragmented the authority for land use decisions.

Special districts have also diffused responsibility for performance of local public functions. They duplicate efforts and make comprehensive solutions to local problems more difficult to achieve.

Many authorities have recognized that only through citizen participation can many of our problems be solved. Concerned citizens have banded together to insure that the people have the opportunity to speak and that these views are seriously considered.

NEPA requires citizen participation on all Federal projects but some officials ignore the input or attempt to avoid citizen participation entirely. Despite the efforts of these officials, the views of concerned citizens are being heard. Groups have stopped projects or modified them to protect the environment.

Environmental groups which were contacted reported some success in protecting the environment but were dissatisfied with the progress. Some groups believe that participation is a matter of opportunity while others think that more education is needed.

Many professionals, professional organizations and college and university professors are willing to assist citizen groups and governmental agencies, but few have taken advantage of their special talents. College students are also available to contribute to EISs or do research for environmental groups.

Private industry makes many of today's land use decisions and claims that each decision considers the environment as a very important factor.

However, few of the industries contacted knew who was in charge of environmental affairs.

There were many opinions of how land use controls should be implemented, but the consensus was that a hierarchy of governmental levels should be used.

The Texas Urban Development Commission has proposed a land resource management system for the state. The system would provide for continuous policy formulation and reevaluation; comprehensive land use planning to reflect changing policy objectives; adequate regulatory and incentive measures to accomplish planning goals; standards of resource use based upon performance requirements which maintain and enhance the quality of the environment; and the professionalization of land resource management capabilities at each governmental level.

The continued reliance on local self determination with a high degree of citizen participation would be the foundation of the system. Local governments would continue to carry the primary responsibility for planning and management of land resources. A significant level of citizen participation in the policy formulation, planning and arbitration functional requirements is prerequisite to the operation of the system.

Most of the case studies point to one major problem--protection of a vital resource, estuaries. Estuaries are being violated by pollution, covered by spoil and eliminated through the restriction of fresh water flows. In the future, land use in the coastal zone will hinge on how well we have preserved our resources. To insure this, we must begin now on the land use plans and enabling legislation for the coastal zone.

RECOMMENDATIONS

EPA should continue its present practice of hiring people with land use management backgrounds.

EPA programs should be coordinated, perhaps through the recently re-organized Office of Grants Coordination which will handle all air, water and solid waste grant programs, to insure a unified approach to solving land use problems.

There should be a draft review by the Environmental Impact Review Section of the Federal Activities Branch of all environmental appraisals and impact statements prepared for wastewater facilities.

Land development patterns are strongly influenced by the location and design capacity of wastewater facilities. Region VI should investigate techniques to include land use considerations in the environmental review of construction grants projects.

EPA should provide environmental specialists similar to those of the Agricultural Extension Service and Soil and Water Conservation Service for the benefit of local officials.

Water and air quality planning should reflect significant changes in land use and major environmental modifications such as reservoirs, channelization and urbanization.

EPA's long-range planning should reflect the possibility of technical innovations making presently designed wastewater systems obsolete. Many projects have a 30 year design life while chemical treatment and other methods may be needed much sooner.

Development in flood plains and low coastal areas should be discouraged through approving wastewater facilities only at higher elevations than these areas. A national EPA policy is needed to insure that each project is safe from floods without special techniques such as diking, flood control dams, and hurricane protection programs.

The policy of funding wastewater facilities for special districts should be reviewed both at the national and regional levels of EPA to determine if the agency wants to continue encouraging unplanned and unregulated growth in rural and unincorporated suburban areas that generally have no planning staff.

Projects to abate future water pollution should have a lower priority than critical existing water pollution abatement needs.

EPA should be increasingly aware of the activities of private companies engaged in the unregulated hauling and disposing of toxic materials. States need some mode of regulation to insure that these materials are not being improperly disposed of on private lands.

Preapplication conferences should be held to alleviate the problem of writing environmental assessments after the planning process is near completion. During the early planning stages it would also be desirable to ask the public if they want the additional percentage of community development that often follows excess capacity facilities.

The inadequate operation and maintenance of wastewater facilities constitute a less than optimal facility and land use. Region VI should prosecute a test case of blatant disregard for the agreement to adequately operate and maintain a wastewater facility for three years as an example that this agency

expects performance within the agreement.

There should be an acceptance of a mutual responsibility by national, state and regional levels to assist and support an enlarged local effort in land resource planning and management.

Texas and other state governments should incorporate environmental impact criteria into existing land condemnation laws.

Louisiana and Texas should formulate spoil deposition plans for the creation of public land for recreation and wildlife areas.

COGs should be given taxing authority and the power to enforce plans, regulate city growth and set regional laws.

Existing enabling legislation should be rewritten to remove the inconsistencies, constraints and built-in fragmentation of local authorizations for land use planning and control.

More adequate authority and capability for planning and enforcement in unincorporated areas should be delegated to local governments.

All levels of government should have professional planning staffs.

A structure should be provided to facilitate and insure citizen participation in policy formulation, planning and arbitration at all levels.

Governmental agencies should make better use of professionals, professional organizations and academic personnel. This might include EPA-funded summer intern programs with students working under a professional for collection of data on specific EISs.

A reward system similar to that of the Internal Revenue Service should

be developed for citizens who spot pollution or violations of NEPA.

Officials should be encouraged to follow the spirit of NEPA in soliciting citizen input.

Federal, state and local coastal zone management should be based on ecology to preserve estuarine ecosystems.

Estuaries should be recognized as unique and critical environmental areas and this status should be reflected in regional coastal zone plans.

DESCRIPTION OF THE COASTAL ZONE

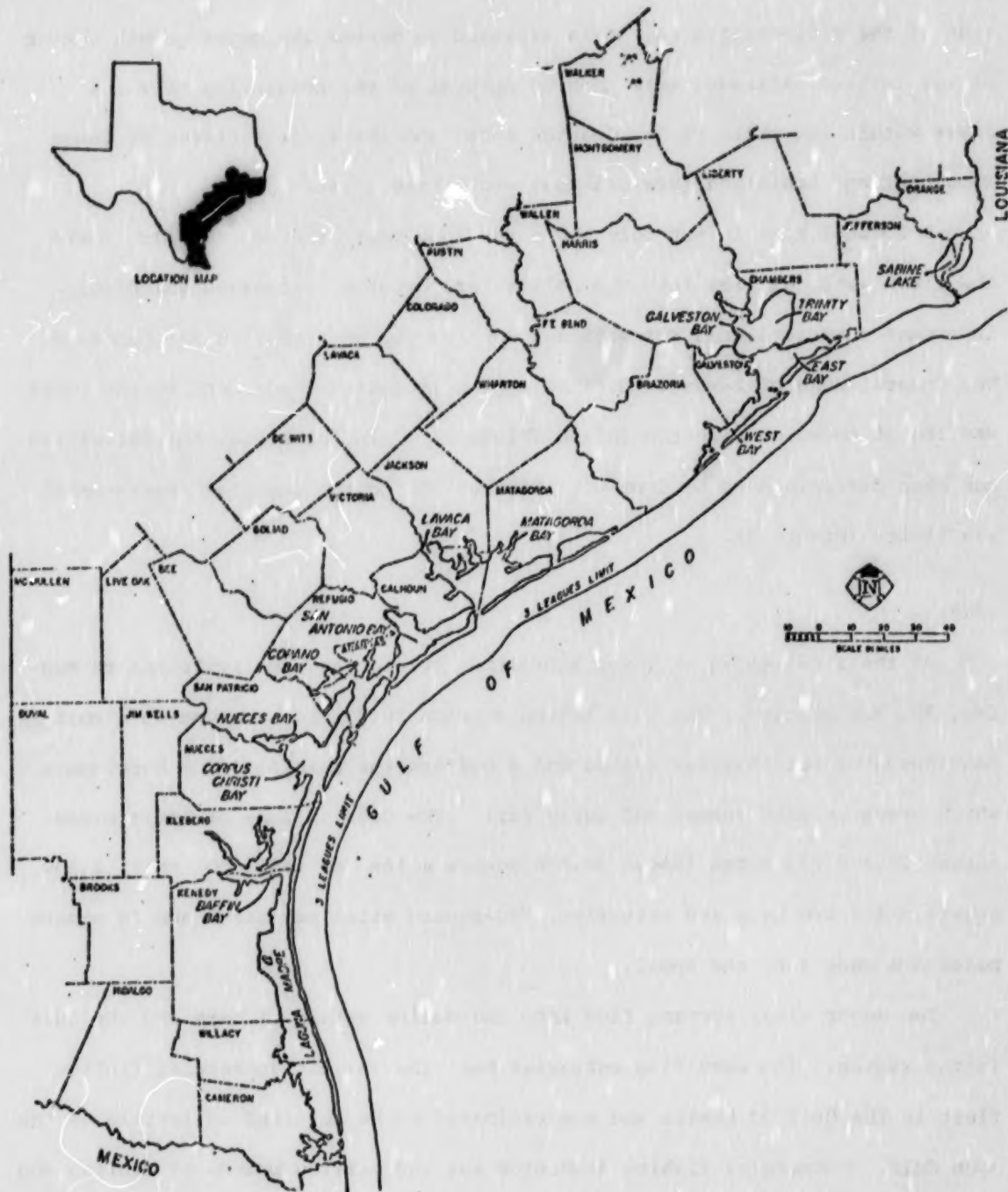
Although the Coastal Zone of Region VI is small in comparison to the rest of the five-state area, it is expected to become the major growth center of the future. Already, more than 50 percent of the population of Texas lives within 100 miles of the Coastal Zone, and the largest cities of Texas (Houston) and Louisiana (New Orleans) are on the coast.

A Coastal Zone is not only where the land meets the sea but also where the fresh water empties into the salt water, creating estuaries which many important commercial and recreational species use as nurseries and habitats. The Coastal Zone of Texas is defined as the 18 counties adjacent to the coast and the 18 counties directly inland (Figure 1). In Louisiana, the definition has been determined to be from U.S. Highway 190 to the Louisiana territorial sea limits (Figure 2).

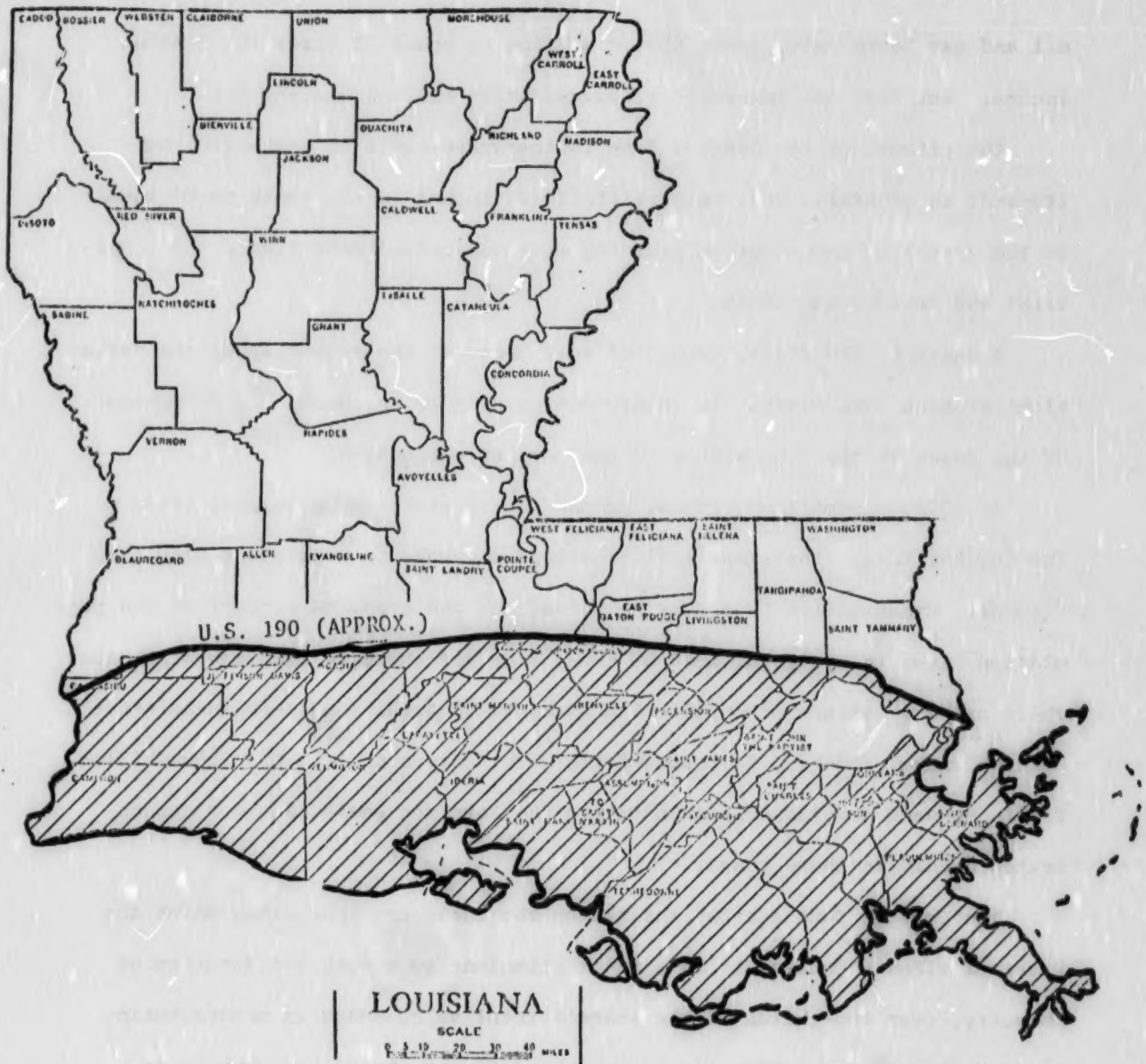
TEXAS

Of the 1,081 miles of Texas shoreline, stretching from Louisiana to Mexico, 301 are beaches. The Gulf Region extends 10.35 miles beyond an almost continuous offshore barrier island which buffers the mainland from hurricanes which occur in late summer and early fall. The Coastal Zone of Texas encompasses 25,394,003 acres (about 39,678 square miles) of land. Of this, 2,100 square miles are bays and estuaries, 760 square miles are marsh and 35 square miles are made land and spoil.

Ten major river systems flow into the saline waters of bays and the Gulf in the region. The resulting estuaries host the largest commercial fishing fleet in the Gulf of Mexico and are estimated to be 20 times as fertile as the open Gulf. Commercial fishing accounted for 148 million pounds of finfish and shellfish in 1968, representing a value of \$49.5 million. Offshore federal



Gulf Coast Region of Texas
FIGURE 1



Gulf Coast Region of Louisiana
FIGURE 2

oil and gas lease sales gross \$593.9 million or about 12 times the fishing income, but fish are renewable resources while oil and gas are not.

The climate of the Coastal Zone is temperate-humid to semi-arid, subtropical in general. This mean rainfall (20 inches in the south to 56 inches in the north) is important in planning wastewater treatment plants and industrial and residential areas.

A chart of the flora, fauna and soil types of the region shows the variations present (see Figure 3). Sixty-one percent of the ducks and 80 percent of the geese in the U.S. winter in the coastal marshes.

In 1970, 3.5 million people, or one out of every three Texans, lived in the Coastal Zone. There was a 21.5 percent increase in population over 1960 figures. Urbanization is occurring throughout the area; 84 percent of the population lives in cities of 2500 or more, four percent more than the state norm. There are five Standard Metropolitan Statistical Areas (SMSA)--Beaumont-Port Arthur-Orange, Houston, Galveston-Texas City, Corpus Christi and Brownsville-Harlingen--and population growth during the last ten years has been concentrated mainly in these areas.

The Coastal Zone economy thrives on the cheap transportation which the water provides. Because it is a major stimulant to growth and location of industry, over two-thirds of the state's total value added in manufacturing is from Coastal Zone industries. One-third of the state's economy is in one-twentieth of the area.

Unrenewable resources such as oil, gas and other minerals are produced in the zone, providing one-third of the state's total value of mineral production. Oil production is about 20 percent of the state's total and offshore mining is a growing industry. The Coastal Zone contains 50 percent of the Nation's petrochemical industry and 25 percent of its refining capabilities.

Biological Features

The major habitats of the region include:

HABITAT	VEGETATION	ANIMAL LIFE
Blackland Prairie	Bermuda Grass Carpet Grass	Whitetailed Deer Small Game
East Texas Timber	Shortleaf Pine Longleaf Pine Loblolly Pine Bald Cypress	Small Game
Coastal Prairie	Oaks Mesquite Rice	Whitetailed Deer Javelina, Coyote, Red Wolf Ducks & Geese
Gulf Coast Marshes	Sedges Rushes Cord Grasses Salt Grasses	Ducks & Geese Whooping Cranes Nutria Alligators
10 River System	Oaks Hackberry Willows Aquatic Plants Grass Flats	Ducks & Geese Alligators Bass, Catfish, Gar, etc. Redfish, Trout, Shrimp, Oysters, Blue Crabs
Barrier Islands	Sea Oats Marsh Hay Cord Grass Morning Glories Sun Flowers	Coyote Periagrene Falcon
Open Gulf	Aquatic Plants (phytoplankton, sargassum, etc.	Kingfish, Ling, Shark, Menhaden, White and Brown Shrimp

FIGURE 3

LOUISIANA

There are 12,000 miles of Louisiana shoreline affected by the tides. The total marshes, bays, and estuaries include over 7,000,000 acres (about 1100 square miles). Forty-five percent of the state consists of coastal and flood plains wetlands. The mouth of the Mississippi River creates deltas which shift with the changing sediment deposition and form the marshes of the Coastal Zone.

Attempts by man to control the natural flooding of the river has changed "significantly the ecology of the Louisiana marshlands."¹ In former times, the sea water was diluted somewhat by the periodic flooding, but the reduction of freshwater inflow has caused much vegetation to die and consequently erosion has begun. These lands are no longer being replaced by sedimentation that occurs during flooding.

Louisiana has been losing about 16.5 square miles a year during the last 40 years due to coastal erosion.² Canal construction and dredging are thought to be responsible for at least 40 percent of the land loss in the last 30 years. As the salt water intrudes, wildlife that lives in semisaline water is forced to move further inland. Although annual commercial fish harvest tonnage has increased this is due to new fishery, menhaden and increased fishing effort.³

The finfish and shellfish production of estuarine-dependent species in Louisiana is greater than one billion pounds a year. Commercial fishermen produce an annual dockside value of \$60-70 million. Although finfisheries are producing well, it now requires five times as much acreage for the equivalent oyster crop of a few years ago.

Louisiana's semi-tropical climate, although more moist, is similar to Texas'. Annual rainfall ranges from 60 inches in New Orleans to 44.8 inches in Shreveport. Hurricanes occur as frequently in Louisiana as in Texas and

often pose a grave threat, but public works projects provide a certain amount of protection. These projects require dredging and filling, since protective levees cannot rise very high due to land unsteadiness.

Louisiana lies in the coastal plain having fertile alluvial and bluff soils. Agricultural products such as rice, soybeans, sugarcane, vegetables and cattle are important in the area and yield \$300-400 million annually. Coastal marshes produce fur-bearing animals and provide sanctuaries for birds and migratory fowl. In the winter, marshes harbor wild ducks and geese, and host one of the nation's largest alligator populations.

Although much of the Coastal Zone is sparsely populated, the population center is moving towards the coast. As more people migrate to this region, finding suitable land for residential units will become a problem.

Presently 80 percent of the tax revenues are in the zone. New Orleans, Louisiana's largest city, moves \$2.8 billion in annual cargo. Other large cities in the Coastal Zone are Baton Rouge and Lake Charles which, along with New Orleans, comprise three of the nation's important ports.

New Orleans has a severe sewage problem and the pollution of coastal waters threatens domestic water supplies and reduces usable acreage for seafood production and recreation. The southern shores of Lake Pontchartrain are often closed to recreation, and organic chemicals such as phenols which cause bad tastes and odors have been found in the water supplies of New Orleans and other communities.

As in Texas, gas and oil production are dominant industries with oil wells alone producing \$1.65 billion annually. For the last 40 years, this has been a major effort, leading to extensive oil pipeline dredging in the coastal marshes. These dredging activities and, more important, the dredging that accompanies port and navigation facilities expansion threatens salinity regimes, cir-

culatation patterns, and marsh integrity, thus affecting the whole ecosystem of the living resources of the Coastal Zone.

FOOTNOTES

1. Louisiana State University, Wetlands: A Resource for the Future, Baton Rouge, 1971.
2. Ibid.
3. Louisiana Advisory Commission on Coastal Zone and Marine Resources, Louisiana and the Coastal Zone--1972, p. 24.
4. Ibid p. 3.

LAND USE IN THE COASTAL ZONE

Land use decisions in the Coastal Zone are made daily and independently. Seven factors affect land use: urbanization, agriculture, waste disposition, recreation, mineral extraction, transportation and wilderness. Efforts of local, state, and Federal agencies to regulate land use are disjointed and as a result, critical problems appear illustrating that a comprehensive plan for land use is essential. Such a plan does not exist.

Competition for land and its uses will increase in the future. The pressures of people seeking homes, jobs and recreation could result in all the concomittant problems in the Coastal Zone of Region VI as they already have in the Northeast Corridor of the United States. Increased activities will bring increased pollution and, equally important, the physical and psychological pressures of a more crowded urban environment. The fragility of the balance of nature is rarely more evident than it is on the coast where many resources are non-renewable. The long-range effects of all Coastal Zone activities, especially those related to land use, must be studied.

URBANIZATION

In the Texas Coastal Zone, 1,000 square miles are urban-industrial-residential and 66.1 percent of Louisiana's population lives in urban areas. Both states are expected to have undiminished migration to the Coastal Zone.

The Dallas-Fort Worth area, although not in the Coastal Zone, continues to expand and construction of the largest airport in the world is occurring between the two cities. Highway Commission Chairman, Dewitt C. Greet, has remarked that the combined growth of the two cities indicates the need for a new road between the two cities. This road, if similar to the existing

turnpike, will spur industrial and residential growth beside it. Land speculation is increasing, and Flower Mound, a HUD New Town, is being built.

Another Texas new town, Woodlands, has emphasized environmental protection, leaving 17,000 acres in a natural state. These acres were chosen on the basis of wildlife useage, and there will be comprehensive, ecological safeguards for the 150,000 acre town.

Flower Mound is also trying to preserve the environment through social and ecological planning. The multiple use concept will serve to conserve land while providing for all income groups and leaving one-quarter of the land as open space. By 1988, 64,000 people will live in the town, with the capability to support 100,000.

The "energy crisis" faces the whole nation. Population growth in Texas and Louisiana is causing the proliferation of plants to serve the need, such as the Cedar Bayou power plant under construction in Houston and the proposed nuclear power plants in Glen Rose (Texas), El Paso (Texas), Saint Francisville (Louisiana), between Houston-Corpus Christi and San Antonio-Austin (Texas).

Nuclear power plants in Texas may not be the conventional type. The University of Texas is investigating the power generated from nuclear fusion. Because of the large expanses of land in Texas, most plants can be placed in areas of little growth and receive little popular opposition.

However, a court suit is pending over the operation of the Houston Power and Light Company Cedar Bayou plant. The company filed suit against EPA to remove the agency's objections to the facility which has a 5,000 megawatt fossil fuel electricity generating potential. The company also challenged the authority of the President to use the 1899 Refuse Act as a tool of pollution control under an Executive Order.

It is claimed the plant will damage the Trinity Bay because it uses un-

clean Houston Ship Channel water and, after use, dumps it into the Bay. The construction of the 2,600 acre cooling pond also would destroy the marshland home of three endangered species--wood ibis, alligator and roseate spoonbill. The results of this case will be crucial to the further growth of Houston and surrounding areas.

Urbanization is becoming a greater problem in Region VI as the population increases. It is hoped that in planning for these people, the area can avoid the mistakes of others that tried to accommodate rapid growth without adequate preparations.

AGRICULTURE

In the Coastal Zone, 5,120 square miles or 41 percent are under cultivation. Ranchers and farmers are improving their lands instead of "moving on" to better land, as they once did.

The Texas Water Quality Board has delayed enforcing its regulations which will put most of the state's feed-lot operations under a permit system that requires storage ponds for run-off water from feedlots. Some operators feel this will put them out of business. Compliance must be reached by July 1, 1973, at an estimated cost of \$8,000-\$15,000 a farm. This is the beginning of a long-term water pollution control project which should greatly affect farm streams and downstream land.

WASTE DISPOSITION

In the Coastal Zone, waste disposal is a particular problem. In Houston it was discovered that the clean up begun earlier this year is losing ground in the area of municipal sewage. Wastewater is being dumped into the drinking water supply and is a potential threat to the population in the

northern part of the city. The BOD and SS loads have increased instead of declining as expected since a \$3 million improvement occurred a year ago at one of these plants.

In Louisiana the large industrial complex from Baton Rouge to the Gulf discharges 40 million pounds of inorganic and one million pounds of organic wastes into the river daily. Other land in this region has already been purchased by industry for future use. EPA discovered 60 major industries discharging into the lower Mississippi River between Saint Francisville and Venice. Heavy metals in excess of five pounds were found in daily effluent from 42 plants.

In this region, the river serves as raw water for 40 utilities that provide service for about 1.5 million people. Mercury has already been found in fish, crabs and drinking water. Many of the industries investigated in this study have begun control programs under the requirements of the State of Louisiana and/or the 1899 Refuse Act, supervised by the Corps of Engineers and EPA.

EPA is also helping Louisiana through PL660 construction grants for wastewater treatment plants. Meanwhile, 40 percent of the urban population's sewage is being dumped untreated into the surface waters, and 65 percent of the industrial wastes are inadequately treated. The water quality standards require that all wastewater have at least secondary treatment which means that about 55 percent of the urban facilities are unsatisfactory.

Solid waste disposal in Louisiana is extremely complex. Because of the high water table, there can be no sanitary landfills in the areas where needed most, the Coastal Zone.

Ocean dumping in the Gulf of Mexico amounts to 800 million tons yearly, and since the cleansing high tides of the East Coast do not enter the Gulf, the problem of dumping is augmented.¹ Drums of waste have been found by

shrimpers closer to the shoreline than the legal limit. If these had broken, the shrimping grounds could have been heavily damaged.

Solid and other waste disposal problems will increase in the Coastal Zone of Region VI. The land cannot accommodate sanitary landfills in many cases and the water must be carefully watched to prevent further pollution.

MINERAL EXTRACTION

The demand for electricity doubles every seven years in Texas; so strip mining, often one of the greatest threats to clean water because of acids and erosion, is being attacked in a new way by Texas Utilities Co. in Fairfield. In a three step process, the earth is stripped away, the coal is extracted and the soil is replaced, replanted and fertilized, thus returning the soil to its original state.

The coal supplies fuel for 1.15 million kilowatt power plant and has "proven that it can be done without hurting the environment."² The fuel is low in sulphur content, releasing less SO_2 as it burns, so it is good for use in heavily populated areas. Texas Utilities is also removing 98 percent of the fly ash which is used to build company roads. To cool the plant a 2,600 acre lake was built and it is stocked with fish. The State Parks and Wildlife Department uses a portion of it as a park. It is estimated that more than 20 percent of the cost of the plant went to environmental considerations. The plant also has a permanent environmental research station on the lake.

Oil and gas production has been slowed down due to the lack of leases, but environmental groups are no longer blocking the sale of leases. Environmental issues surrounding the sale of leases have diminished because, using adequate precautions, offshore operations can protect the environment to a greater degree than before.

Environmental problems do exist--(1) gas and oil as nonrenewable resources, (2) air pollution, (3) oil spills, (4) disposal of solid wastes and other pollutants from construction dredging and oil rig operations, (5) daily discharges of oil, (6) explosives used for the exploration, and (7) use of established pipeline corridors to prevent further disturbances of marshland and commercial fishing areas.

Oil companies are responding to some of these hazards through the development of safety valves and reduction of SO₂ fallout. While working on other methods such as chemicals that put a "ring around" spills to clean them, the oil companies realize that by 1985, 14.55 percent of the anticipated domestic 14,200,000 barrels daily of crude oil will be supplied by the Gulf of Mexico production.³

By 1995, much of the coal will be expended and around 2020 oil reserves will be exhausted. In meeting the energy crisis, non-renewable resources must be used wisely and the environmental protection methods surrounding mineral extraction must be sound.

TRANSPORTATION

As one of the major keys to growth and development, transportation and the land it affects will continue to be a growing issue. The Coastal Zone uses much water transport because of its efficiency and economy. But, sealand is greatly affected by the dredging to make canals and waterways.

In both Texas and Louisiana, superports are being considered. Through the use of large, containerized cargo carriers, commodities previously shipped to Newfoundland or the Bahamas could be directly shipped to the Gulf ports. Louisiana is also considering an oil port which is being encouraged by private industries. The new jobs would draw increasing numbers of people to the coast.

In Houston, all types of transportation systems can be seen clustered

around the Ship Channel. In the Dallas-Fort Worth area, planners are considering new roads and transportation facilities to serve the new Regional Airport. In addition, the Trinity River may be opened for navigation from Fort Worth to Galveston Bay.

Mass transportation systems that will discourage the use of cars are being considered. The Dallas-Fort Worth area has been selected by the Department of Transportation as a pilot project for a Tracked Air Cushion Vehicle pending a feasibility study and community funding.

RECREATION AND WILDERNESS

Much of the Coastal Zone consists of beaches which are inaccessible to the public and thus restrict recreation. Private land developments for residential/recreational purposes such as Padre Isles, Texas, and Eden Isles, Louisiana, have appeared.

Although land is a non-renewable resource, a shortage of it does not yet exist in Region VI. Problems of topsoil erosion and destruction of vegetation do occur because it is easier to strip and construct than to build-in environmental protection. Man caused erosion has far surpassed naturally-caused erosion.

The Coastal Zone of Texas has 213 square miles of wildlife and hearings are being conducted in Washington to discuss the potential creation of Big Thicket National Park. The 300,000 acre thicket is in a 3 million acre basin where eight ecological systems converge. Presently, squatters and lumbermen inhabit the area.

The Armand Bayou Park, Texas, proposed by HUD, would set up a 3,000 acre park in one of the last "natural state" bayous in Texas. If HUD does not obtain the land, the Friendswood Development Company will build residences in the area. The results of this could foretell the future of much of the

wilderness land remaining in Texas and Louisiana.

FOOTNOTES

1. Houston Post, March 18, 1972.
2. Fort Worth Star Telegram, July 25, 1972.
3. EIS Draft, Crude Oil and Natural Gas Production and Other Mining Operations in the Navigable Waters Along the Louisiana Coast, U.S. Army Corps of Engineers, February, 1972, (06-2-164), p. 28.

PRESENT AND POTENTIAL IMPACT OF EPA ON LAND USE IN REGION VI

As part of a national attempt to gauge EPA's influence on land use and to formulate agency policy, the Region VI Land Use Task Force researched the regional program. Under cover letter from the Regional Administrator each division and branch office received a questionnaire addressing general questions about land use. The responses were highly varied in content and thoroughness and were used to gain some insight into the attitudes and emphasis on land use management as an environmental protection tool. The questionnaire was followed by interviews with specific program offices that impact land use.

In hopes of maintaining a functional working relationship and an accurate assessment of the various programs, each respondent was asked to read what had been written about his office's programs and activities. The regional staff was extremely helpful in commenting on the preliminary reports and in offering ideas and suggestions.

OFFICE OF THE ADMINISTRATOR

William D. Ruckelshaus and the Headquarters of EPA "have become increasingly aware of the close and important relationship between land use planning and environmental protection."¹ It is clear to him that "many of our standard setting and other regulatory functions have a significant impact on the uses that may be made of particular parcels of land."¹ At the same time he feels "that land use decisions made in other sectors of our society clearly affect our efforts to enhance the environment and, indeed, may in some cases make it difficult for us to reach minimal standards of environmental quality."¹

He realizes that EPA needs "a better picture of the relationships between land use policies, practices, and mechanisms and environmental protection, particularly from the point of view of EPA's operating responsibilities." As a result, Ruckelshaus directed his National Youth Advisory Board to proceed with a national land use survey. In the same memo he said, "I believe the Board is in a position to conduct considerable research at both the regional and at the national levels, to facilitate our understanding of the relationships between land use and environmental protection..."¹

Ruckelshaus told the National Association of Homebuilders that while the United States has plenty of acreage, "we do not have enough land for all purposes where we need it, when we need it. That is partly because of population growth, but largely because we have failed to rationally organize the use or non-use of what we have. Moreover, there is no question that every time we in EPA set an air or water quality standard or take action against industrial or municipal polluters we are directly setting standards of land use."²

OFFICE OF THE REGIONAL ADMINISTRATOR

The Administrator of Region VI, Arthur W. Busch, is responsible to Ruckelshaus for the execution of regional programs and any other assigned responsibilities. The impact of the Regional Administrator's Office on land use is inherently related to all programs, policies, plans and impact statements that are generated by the staff.

In an attempt to gain some in-depth perspective on those EPA policies and programs affecting land use, the Regional Administrator re-assigned the Youth Advisory Board to his office. Under his direction, and in conjunction with the Administrator and the National Youth Advisory

Board's Land Use Summer Program, Region VI YAB Land Use Task Force began a three month comprehensive study of land use in Region VI.

Busch placed a high priority on the land use study to insure a good perspective of land use problems in Region VI and how EPA may be affecting them through its broad environmental program. Busch designated Deputy Regional Administrator, George R. Alexander Jr., as the Land Use Study Director. The study interns included four members of Busch's Youth Advisory Board with expertise in biology, anthropology, journalism, and urban planning.

The Regional Administrator has addressed the question of land use on several occasions and maintains a working relationship with other Federal agencies concerning the subject.

A typical example is his response to a Draft Environmental Impact Statement prepared by the Bureau of Outdoor Recreation. "Your agency's awareness of the need for diversity of land use within our cities is to be commended. In general, the statement covers many of the environmental impacts of the proposed action.

"In the absence of land-use plans and policies within the City of Lubbock for control of development around the proposed park, implementation of the proposed action may result in a commitment of land and material resources which will be unusable in a few years due to uncontrolled industrial or commercial development reducing the acceptability of the park by the public. Therefore we would suggest that you consider land-use planning restrictions in the area be a prerequisite to using Federal funds."³

OFFICE OF THE REGIONAL COUNSEL

The Office of the Regional Counsel has tremendous potential for affecting land use through its legal and technical evaluations of Region

VI project proposals and policy recommendations. Specific actions which might have impact on land use are: land condemnation, Environmental Impact Statement (EIS) review for legal and technical content, and specific advice and recommendations to the Regional Administrator on environmental issues and policies.

In a newsletter from a citizen's group formed to "Save NEPA", sample cases which had a positive environmental impact under court rulings utilizing the National Environmental Policy Act were listed. Gibson vs. Ruckelshaus, a Region VI case, is unique in that the resulting ruling had a negative effect on the selection of a wastewater facility site.

The following information is from the case files of the Regional Counsel and shows how NEPA can halt condemnation of private land to be used for a wastewater treatment facility which utilizes Federal funds. The case is one of two in Region VI contested because of no EIS.

EPA had nothing to do with the site location and virtually no Federal money had gone to purchase the site. The result of the Gibson vs. Ruckelshaus case was that another site (the Baschum site) was chosen directly across the creek at a substantially higher cost and with little environmental advantage over the first site. According to Tom Harrison, head of Enforcement, "the desirability of the two sites was almost equal, the final site selection was on higher ground (not as susceptible to flooding) and had better access."

The East Texas city of Lufkin had only one sanitary wastewater treatment facility with a capacity of approximately 1.5 million gallons per day, but the plant discharged approximately 3 million gallons per day. The quality of the effluent from the plant was approximately 120 parts per million (ppm) of Bio-chemical Oxygen Demand (BOD) and the Texas Water

Quality Board (TWQB) required 20 ppm of BOD. In 1968, TWQB ordered the city to build new facilities and clean up the effluent.

The site of the existing Lufkin plant was considered undesirable for the proposed new facility because commercial and residential development had occurred adjacent to the plant. It was thought that "additional overloading of the existing plant could have a serious effect on surrounding developments such as decreased property values that might result from obnoxious odors."⁴

The city chose a site approximately two miles south of the existing facility on the same creek, and a state permit was approved. Substantial development had not occurred downstream because (a) the existing gravity flow collection system required all development to occur at a higher elevation than the plant; (b) wastewater treatment was required for any major housing or commercial development; and (c) the highly polluted state of the area below the existing plant was malodorous and undesirable for residential development.

In June of 1969 an application for a PL660 Grant from the Federal Water Quality Administration (now EPA) was made and in July of 1970 Lufkin was offered a \$1,180,000 grant. The city held a successful \$3.1 million bond election for its share of the construction of the plant and the collection systems.

The city proposed to acquire approximately 80 acres out of a 1200 acre tract of land owned by the Gibson heirs. Because the tract was located in a remote area that was being used for cattle grazing, the land was appraised to be worth between \$125 and \$175 per acre. The city made an offer of \$200 an acre for the land which was immediately rejected. The Gibson heirs told the city they wanted \$3,000 an acre

A city survey showed only 62 residences in an 8 square mile area around the site. The survey report said that no houses had been constructed there since 1960; however, it was pointed out later in the hearings that one of the houses had been constructed in 1962 and one house was under construction. There was also an indication that some tracts within the 8 square mile area would be subdivided in the near future.

The legal events which took place prior to the condemnation of the property were apparently not sincere environmental concerns. The fact that EPA had not filed an EIS as required under NEPA, served as a legal tool for Gibson to prevent condemnation. The Gibson heirs filed suit on January 29, 1971, in Federal District Court in Tyler against the City of Lufkin and William D. Ruckelshaus, Administrator of EPA. The complaint alleged that EPA, as required by NEPA, had not made a study of the area's environment and that this facility would damage the ecology and waste tax funds. After several appeals, the Gibson heirs were upheld.

The Office of the Regional Counsel feels that others will use NEPA to stop condemnation of land as long as present state procedures do not require the inclusion of a statement of environmental consideration. If additional criteria were added to include that "future land use will have no negative environmental effects," NEPA could not be used to halt the land acquisition.

SPECIAL ASSISTANT FOR RESEARCH AND MONITORING

The Region VI Special Assistant for Research and Monitoring solicits and defines research and monitoring needs of the region

and transmits them to Headquarters. He promulgates research and monitors program results throughout the region both within and without the agency. Because he assists in negotiation of proposals, as required, and stimulates submission of grant and contract proposals, this office could be important in looking at the interactions between land use and environmental quality.

Presently however, its activities are considered in terms of land use only to a limited extent. The effects of land use--urbanization, agriculture, industry, etc.-- are the primary subject of research activities.

Land use management enters into the decision making process when consideration is given to the environmental effects of research and Demonstration Grants projects; in particular the effects on concurrent or potential users of the natural resources effected by project activities. The office has studied runoff from various types of land uses (Tulsa, Oklahoma).

PUBLIC AFFAIRS DIVISION

The Public Affairs Division advises and assists the Regional Administrator and his staff with public relations. The division represents the Regional Administrator in relations with the media and administers a comprehensive information program. Public Affairs answers all inquiries for environmental information.

It maintains files of environmental articles on all subjects including land use that appear in major regional newspapers. The availability of these files for the summer study was helpful in gaining a perspective of land use problems. There are no land use articles from the states of Louisiana and Oklahoma. Whether this is a result of the area's lack of interest in land use planning has not been determined.

Public Affairs has cooperated with the YAB Land Use Survey by forwarding land use articles to division and branch offices which might find

them interesting or helpful in including land use considerations in their programs.

OFFICE OF GRANTS COORDINATION

GRANTS ADMINISTRATION BRANCH reviews, plans, coordinates and directs regional implementation of the national program involving grants to municipalities, intermunicipal and interstate agencies for the construction and operation of wastewater treatment facilities. Land use implications of this program include abandonment of outdated facilities, designation of other land for waste treatment facilities and influencing land development trends through location of facilities.

Eighty percent of Region VI's budget is allocated to the construction of wastewater facilities. Administration is difficult because of limited grant money, large numbers of applicants and poor coordination with state and local planning efforts. The major objective is not to influence land use but to abate water pollution. The general attitude is that how subsequent development occurs is up to local governments.

In the engineering review of applications, EPA depends on local and state clearinghouses for information regarding effects of projects on land use. Site selection is the responsibility of the applicant since local planners are more familiar with its political and social implications; also, only the local decision makers are knowledgeable of costs and availability of land.

The problem of how wastewater facilities may adversely affect land use is apparently caused by lack of planning on the local level and sporadic development by private developers in unincorporated areas. Many municipalities have urban planners to coordinate planned facilities with existing and future developments. However, EPA's policy of funding wastewater facilities in special districts generally supports unplanned growth

since many of these entities have no formal governments or planning staffs.

The Houston area has 253 governmental entities which have fragmented authority and overlapping jurisdictions. These governmental units individually request funds for existing and future wastewater facility needs. The result is that individual governments are happy but the overall effect is an ever-expanding and more densely populated metropolitan area. EPA is responding to the individual community needs perhaps without realizing that it is contributing to this land use trend.

Each state prepares a priority list of wastewater facility needs; EPA reviews the applications and funds facilities that are on the list. The state's list is ranked in order of critical needs, but the availability of funds and the submission of an adequate and complete application seem to be the deciding factors in approving the project by Grants Administration. If the top priority city submits a poorly prepared application and a low priority city submits an adequate and accurate application, then the lower priority city is considered first. The Water Programs Branch then reviews the application. If the project complies with the basin plan, it is approved; but if the application does not comply, the area plan must be revised before the grant offer can be made.

Conflicts between Grants Administration and Water Programs Branch stem from lack of coordination between the applying municipality and the existing plan for the area or basin. Often the approved plan calls for a regional plant to serve several cities; but area municipalities, either through lack of knowledge or in spite of the existing plan, proceed with engineering studies and consultant work to solve immediate pollution problems.

Through investigation of various projects and discussions with the Regional Counsel and the Assistant Regional Administrator for Congress-

sional and Intergovernmental Relations, an illegal technique utilized by some cities to apply for PL660 grants was found. The fraudulent application utilizes the city government as a figure head for the developer's treatment facilities. The developer contributes the city's portion of the matching money and under the signature of the city manager forwards the application for consideration by EPA. A major Texas Gulf Coast city used this technique exclusively and it has been the standard method of expanding the city's wastewater facilities out to new developments. The developer is required to provide the city's portion of the grant as a prerequisite of the city's acceptance of the development.

The "usual" wastewater facility in Region VI is built for larger than existing needs of the community. Building these facilities with larger capacities is an admission that further growth and development is expected and perhaps will be encouraged by the project.

During the planning stages, it would be desirable to ask the public if they want that additional percentage of industry or people in the community. Small recreational communities in unique areas may favor controlled growth to retain the uniqueness of the area. This attitude of controlled growth may play an important part in planning capital improvements in cities of the future. Adequate public participation should reveal any trend in this attitude in Region VI.

The additional design capacity is perhaps the most economical way to handle the projected growth of our cities, but there is some evidence that EPA is funding wastewater facilities which will directly affect the further sprawl of metropolitan areas and yet not serve a single residence upon completion. One such plant involves the funding of a wastewater facility that will be built to accommodate future private development exclusively (see Figure 1). The agency, while funding the project without requesting any

FIGURE 1

GRANT AWARD INFORMATION

NOTE: AWARDS ARE SUBJECT TO DECLINATION BY APPLICANT

1. EPA INQUIRY CONTACT OFFICE OF LEGISLATION Betty Maynard		TELEPHONE 202-755-0994	2. GRANT AGREEMENT TO BE MAILED TO APPLICANT ON OR AFTER: 8/2/72	
3. FROM (Region or Grants Administration Division) EPA, Region VI Dallas, Texas 75201		4. SERIAL NUMBER SIX-C-18	5. DATE OF AWARD 7/26/72	
6. APPLICANT (Name, Street, City, State, Zip Code) Special District		7. LOCATION (Project Sites) North of Stafford, Texas		
8. COUNTY (S) Fort Bend	9. STATE (S) Texas	10. CONGRESSIONAL DISTRICT (S) 06	11. POPULATION SERVED 0 (To be served-10,700)	
12. COMMUNITY REPRESENTATIVE OR PROJECT DIRECTOR (Name, Title, and Telephone) President		13. GRANT/PROJECT NO. C-480943	14. TYPE OF APPLICATION (New, Continuation or Increase) New	
15. GRANT PROGRAM Wastewater Treatment Works Construction		16. AUTHORITY AND CRITERIA P.L. 84-660, as amended, A, D & E		
17. TOTAL PROJ. PERIOD NA	18. BUDGET PERIOD NA	19. TOTAL ESTIMATED COST \$900,000.00	22. AMOUNT OF GRANT AWARD	
20. EPA PROJECT OFFICER (Name and Telephone) Kenton Kirkpatrick (214) 749-1911		21. TOTAL ELIGIBLE COST \$900,000.00	\$495,000.00	
23. PROJECT TITLE AND DESCRIPTION Interceptor sewer, force main and lift station.				

24. OTHER INFORMATION

\$45,000.00 included in grant offer for area-wide planning.

25. FISCAL DATA					
FY	ALLOWANCE NUMBER	AMOUNT CHARGED	FY	ALLOWANCE NUMBER	AMOUNT CHARGED
72	206-A5	\$495,000.00			

development plan, included a \$45,000 bonus in the grant for the site being located in an area-wide quality planning area. It is debatable whether the total grant will reflect a lower purchase price of homes, but it can be assumed that without Federal funds the development might not have occurred and thereby retarded urban sprawl.

New technology may make treatment facilities obsolete long before their expected life spans of 10-30 years. Biological treatment of wastes is now used, but environmental engineers predict that chemical treatment of wastes will be used in the future. The chemical precipitation of wastes from water is much more reliable in terms of a steady state effluent, and chemical treatment is relatively unaffected by slug flows of toxic materials and other bio-physical factors which affect biological treatment efficiency.

Using water as the waste carrier, gravity flow systems are the most economical. However, from the standpoint of land use, wastewater treatment and conservation of water, this type of system is inadequate and wasteful. Ninety-eight percent of the flow to the wastewater facility is represented by the carrier. The more concentrated the effluent the easier it is to treat and less land, equipment, chemicals and labor are needed for operation of waste treatment facilities. Yet, under present techniques, the waste is diluted more than necessary. Just because a system has been used traditionally, does not mean it is the best method.

New systems have been developed in the Scandanavian countries which could revolutionize wastewater treatment and water demands. These systems operate with air as the carrier system for moving human wastes to treatment centers. It is claimed that the wastes are much easier to handle and that labor and equipment demands are reduced by roughly a factor of ten.

The land use implications of the air carrier system could be substantial in that not only would treatment facilities (sewer lines, intercep-

tors, and treatment centers) require one tenth of the materials to construct, but the standard 100 gal/person/day of water required by residents would be substantially reduced. This reduction of the amount of water needed could significantly impact the ground water supplies and reduce the need to build reservoirs to support our cities' water needs in the future. It would, however, contribute to additional power requirements for an area.

NEPA puts the responsibility of evaluating the environmental impact of wastewater projects directly on EPA. The applicant assists EPA by submitting an environmental assessment of the project as a condition for a grant. From the environmental assessment, the EPA project engineer makes an environmental appraisal (presently through the use of a standard pre-written form) and documents it in the regional files. At this time, any issues concerning the project are to be confronted and investigated before making the grant. The decision of whether an EIS will be prepared is based on the EPA appraisal and comments from other interested parties.

Private contractors of wastewater projects generally don't have the expertise and interdisciplinary staff to fully consider the environmental aspects that ideally are included in the early stages of project planning. It is EPA's responsibility to aid private contractors and local governments in the proper preparation of environmental assessments. but the expertise of EPA engineers is in design and construction of wastewater facilities, not environmental impact, planning and ecology.

The 31 member staff of Grants Administration spend 80 percent of the Region VI budget while representing only 10 percent of the total regional staff of 297 people. Until the staff size is increased there appears to be no way of maintaining a functional, meaningful environmental analysis process within the wastewater construction program. The branch is in

critical need of additional support in this area. Until this support is obtained, the inclusion of land use and other important factors will have to be forfeited.

Some project evaluations hold the region open for court action or public criticism. A case in point is a recently funded project involving the construction of an interceptor sewer and lift station for a municipal utility district near Houston. It shows how EPA is directly influencing the amount and direction of development of Houston without addressing these factors in the appraisal. It is also significant that no alternatives to the project were considered. This is a direct violation of NEPA.

To conform with the intent of NEPA, assessments and statements should include: (1) identification and comparison of alternative solutions, (2) opportunities for meaningful public participation, (3) consideration of a wide range of environmental issues, and (4) compliance with local plans for community development.

In Region VI there have been only five EISs written for EPA wastewater facilities. The regional office believes there is little difference between a good assessment and an EIS. The only difference should be in the amount of exposure the documents receive, one staying at the local and regional level while the other is finally reviewed, by CEQ in Washington. There is, however, a great difference in thoroughness.

The subject of land use trends and projections have been covered in the comprehensive plan of Hot Springs, Ark., and other EISs. The following is an excerpt from the Hot Springs EIS: "The comprehensive plan for the City of Hot Springs...outlines the present and projected land use situation in Hot Springs and the surrounding area. The more important points...include

the absence of any residential development within a mile or more of the proposed wastewater facility site and the relatively low concentration of persons projected for that area in 1995."⁵

Presently there is no mention of land use in the environmental assessments reviewed by this office. Even though the general public may not be concerned with the issue, it still may be the responsibility of EPA to mention the impact of facilities on land use trends and potential in the environmental appraisal.

An increase in public participation in the planning stages of these facilities may be expected to (a) increase the current low level of public input in many of the projects, (b) focus some attention on many of the currently unmentioned environmental problems associated with wastewater facility construction (such as land use), and (c) reduce the number of EISs because problems will be solved early in the planning process.

SURVEILLANCE AND ANALYSIS DIVISION

The Surveillance and Analysis Division, affects land use primarily through its support of the enforcement permit program. The division collects, analyzes and evaluates environmental quality data in support of regional and national monitoring. Activities include surveillance, pollution source inventory, monitoring activities within the region and necessary analytical laboratory support. Another important responsibility is to assist state and local techniques, methodology, quality control and laboratory support when required. The division acquires necessary data to support enforcement actions, as required by the Enforcement Branch.

The Surveillance and Analysis Division is anticipating types of land development which may affect its operations in the future, such as the recent channelization of the Arkansas River. The project changes the natural

flow of the stream to quiescent pools with a series of locks and dams which will open the waterway to barges. Channelization of the river, while changing the overall biological aquatic system, elevates the land use potential along the new waterway to a higher use--from flood plain farming to residential and industrial development.

The immediate area adjacent to the waterway will be used as terminal areas for moving raw materials and finished products up and down the Arkansas River. Along with the expected increase of industry and housing (which is already apparent in the area) will come additional air pollution, wastewater and solid waste loads.

Water quality plans must be revised after the alteration of the river and subsequent development, since the ability of the stream to assimilate waste and carry on natural biological treatment has been greatly reduced. Due to the damming effect of the lock system and the deepening of the natural stream channel, conditions for mixing, reoxygenation and other physical and biological parameters involved with self-purification have been reduced. To prevent anaerobic conditions from occurring, a new total stream waste-load should be calculated for the industrial and residential waste-water plan. Since a rise in the potential land use of the area and a lower carrying capacity of wastewater loads are generally conflicting, special planning should insure that both can occur without negative effects on development or the environment.

The Trinity River Project of Texas would require exactly these types of special water quality planning considerations. Presently Dallas and Fort Worth contribute the majority of the flow in the upper Trinity Basin. TWQB has enforced a waste discharge from the cities containing no more than 20 ppm BOD and 20 ppm of suspended solids (SS) or less. With the Trinity River Pro-

ject a possible future reality the TWQB is urging the cities to reduce effluent concentrations still further to as low as 6-10 ppm BOD and SS in anticipation of the reduced capacity of the river to handle waste loads. In conjunction with the permit request, the TWQB has also requested that some phosphate reduction be included in the new water quality plans of the area.

Surveillance and Analysis believes that as the quality of effluent improves there will be such a demand for the wastewater that industry or agriculture will be willing to pay for it. This may cause changes in land use near wastewater facilities and may compound the problem of minimum flows for the Upper Trinity River. Total recycling of urban wastewater should bring some serious legal questions concerning water rights of cities and other users downstream.

As effluent monitoring becomes more organized and efficient at the local and state level, the Surveillance and Analysis Division anticipates more alternative disposal practices, many of which have direct land use and environmental implications. The alternative may be more harmful to the environment than the original dumping in the watershed. There are three alternative methods of prime concern--deep well injection, ocean dumping, and dumping on private lands (to ultimately return to the watershed).

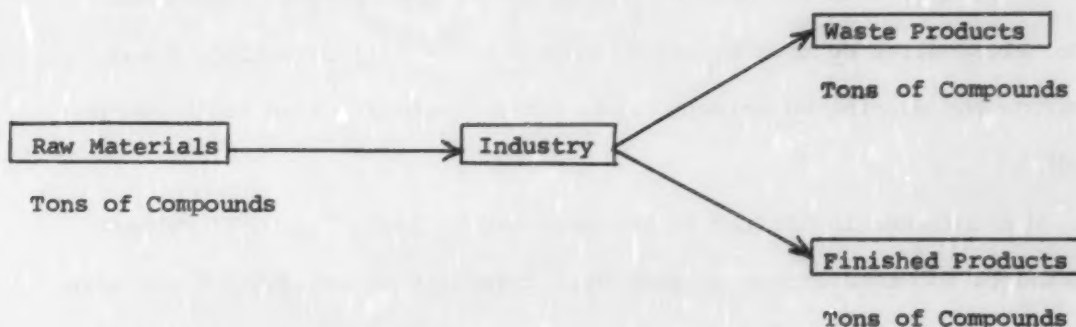
The increase in hauling toxic waste materials in Region VI can be attributed to restrictions on deep well injection, ocean dumping and more stringent effluent standards. Already there are over 122 private companies engaged solely in the disposal of toxic materials in the five state area. Presently there are no restrictions on where or how these materials are disposed of on private lands. In coastal areas of Texas and Louisiana there is a definite possibility that these materials are already contribu-

ting to the pollution of underground water supplies.

There is also illegal dumping along roads and in state waterways. Extremely difficult to regulate, the illegal dumping of toxic materials can occur at different points along a stream with the private disposal company using a different dump site and time for each offense.

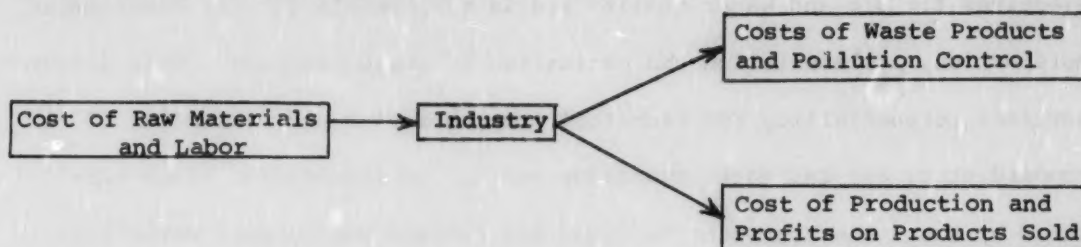
The interrelationship between solid waste, air pollution and water pollution is not always apparent. As an example, if a state air control board orders a company to reduce its particulate emissions and the company constructs a water operated scrubber, the air pollution problem may have been solved but a water pollution problem has been created. Wastes from industries and consumers enter the environment in many forms and there needs to be a better way to monitor this.

One method might be to require each industry to submit a complete mass-balance of compounds and the atomic weight of each element used in its operations. Quantative and qualitative records of raw materials used in the production of X amount of products with Y amount of waste is needed for the system.

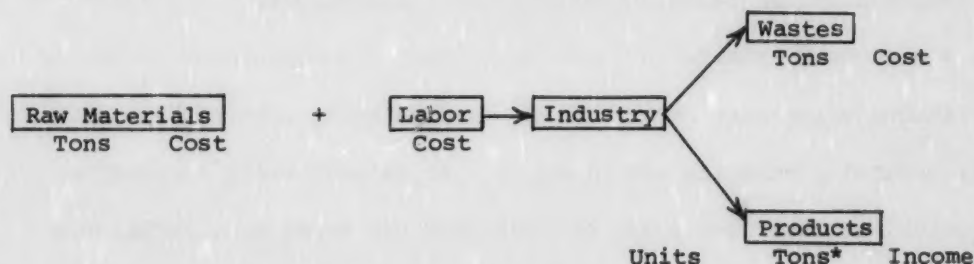


Industry may be opposed to a system such as this because various secrets might be divulged by the record. Dr. Roy Hann of Texas A&M University feels that industry, if required to participate in such a comprehensive environmen-

tal control system, could adequately shield its secrets by making the mass balance for each industry a secret.



In terms of record keeping and accounting, the system might parallel the existing Federal Revenue Service system so closely that the two could be administered and regulated at the same time. The quarter's mass balance of raw materials, products and wastes could be included with quarterly income tax reports.



A recent problem is pesticides seized by EPA because of nonconformity with label specifications or illegal transportation across state lines with the proper permit. There has been some concern over the future of these materials. While storing these potentially dangerous materials in warehouses is a temporary solution, other alternatives are being considered by the Surveillance and Analysis Division. The division proposes to dispose of these materials by chemical means after they have been grouped into similar and nonreactive sets.

* Tons that will ultimately return to the environment as wastes.

AIR AND WATER PROGRAMS DIVISION

The Air and Water Programs Division establishes goals, priorities, and objectives for air and water quality and is responsible for the development, coordination, implementation and evaluation of these programs. This division exercises responsibility for technical program review and evaluation of (1) proposed state air and water standards and (2) implementation plans submitted by the states pursuant to Clean Air Act and the Federal Water Pollution Control Act. Review and evaluations take all environmental factors (including land use) into consideration.

Land use is considered only as a management tool in maintaining environmental quality. There is a need for a professional planner to help coordinate the programs. Population projection coordination between the various branches is one function this person would perform.

The AIR PROGRAMS BRANCH is aware that "land use management is one of the key factors which must be considered in developing control strategies for environmental protection and planning. It is absolutely imperative that political entities are aware of good land use management techniques and are provided the necessary legal authority and regulations to permit these techniques to be implemented."⁶

Under section 10 of the Clean Air Act, the state implementation plans for air pollution control are required to include land use and transportation controls which may be necessary to insure attainment and maintenance of the National Ambient Air Quality Standards. The Air Programs Branch will assist the states in Region VI to define this problem and prepare portions of state implementation plans which must be submitted to EPA on February 15, 1973.

The plans must also include a procedure for review of the location of

sources of air pollution to determine if the achievement of the National Ambient Air Quality Standards within the region will be impaired. These plans have exciting potential for altering land use patterns in a positive way. In effect, EPA can disperse industry, thereby affecting land use through enforcement of Air Implementation Plans.

Population projections for air implementation plans are based on the 1970 Census and are provided by the state preparing the plan. Because of the differences in interpretation and variations of how population figures are derived, accuracy may vary from state to state and city to city. If the figures are "within reason" and based on the 1970 Census, they are considered acceptable.

Population data is a controversial matter among state and local governments. The sociol-economic and political aspects of population and growth projections are up to the local governments to derive; however, in EPA's planning process, it is necessary to gauge these projects in some way such as Ober's Method.

The Land Use Planning Branch of the Applied Technology Division of the Office of Air Programs in Durham, N.C., and the EPA Region VI Air Programs Office maintain liaison with local and state planning agencies to assist them with site location strategies in air quality implementation plans.

The two offices have begun a joint research effort in Houston to utilize changes in traffic flow patterns and parking availability as an aid in air quality control. The research will be carried out by a private firm, under an EPA contract, which will look into the possibilities of this technique being used to improve traffic flow and air quality simultaneously.

The WATER PROGRAMS BRANCH plans, coordinates and directs regional implementation of programs for water quality management. It also conducts inter-agency activities for the protection, preservation and enhancement of water resources and supports national and regional policies and objectives, including establishment of Federal responsibility for water supplies used by interstate carriers. The branch's overall objectives are meeting water quality standards and maintaining and upgrading water quality; influencing land use is not a primary objective except as related to water quality.

Water quality management planning is "intended to provide a continuous, systematic and coordinated development of efficient and effective courses of action to protect or enhance the quality of the waters of a discrete area."⁷ The program presently has an indirect but significant impact on land use. Municipal wastewater treatment plants are located with respect to present land use; i.e. existing population and industrial concentrations. The location of the treatment facility and wastewater collection system dictates the direction in which future industrial and residential growth is likely to occur. The plans which include investigations and studies of present and projected land use will be a factor in determination of projected needs for wastewater treatment facilities.

Metropolitan/regional water quality management planning, basin water quality management planning and comprehensive area-wide planning are all inter-related processes (see Figure 2).

Basin plans generally provide an overview of the impact of pollution sources, alternative pollution control measures on the receiving waters, basic information on stream flows and water quality, and requirements for jurisdictional cooperation. In various stages of completion in Region VI,

WATER QUALITY MANAGEMENT PLAN RELATIONSHIPS

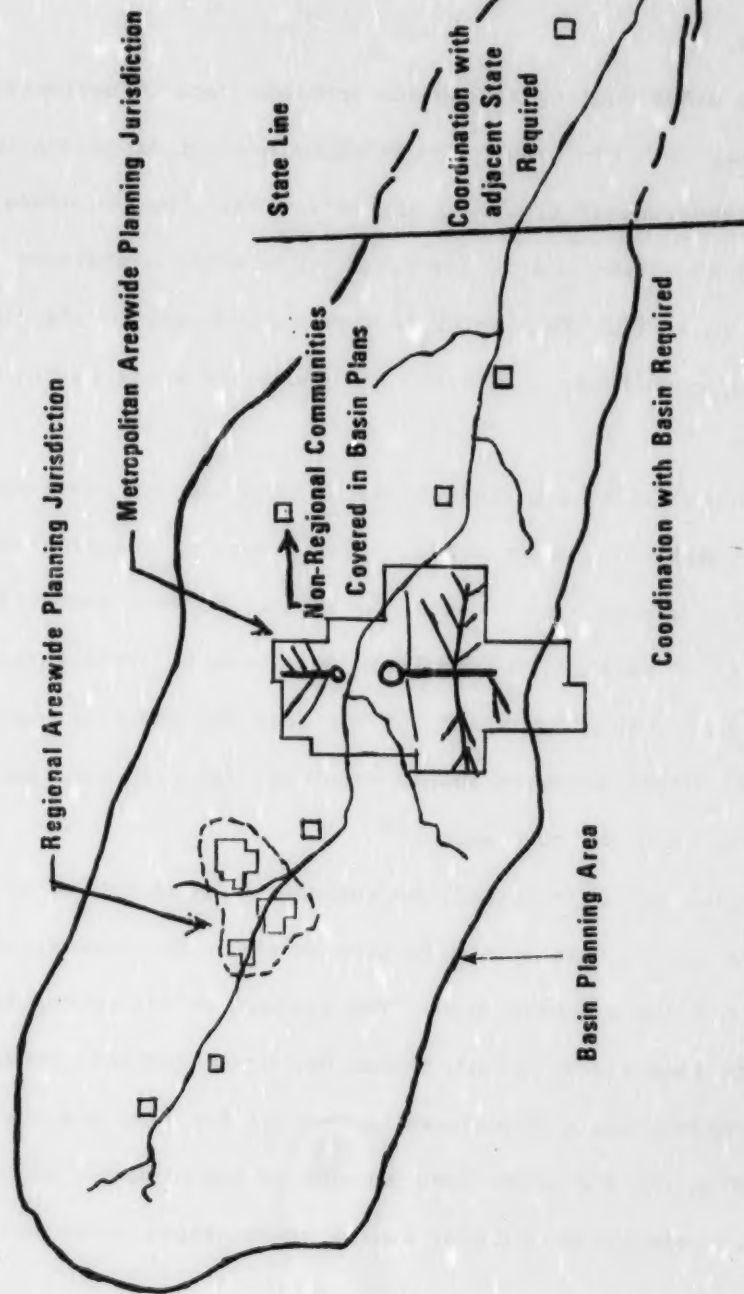


FIGURE 2

they include basic information about the areas and describe significant activities and land uses which have an impact on water quality. The basin plan defines the total allowable discharges among the individual waste sources.

Specific water quality management problems such as agricultural run-off are covered in basin plans. An Oklahoma project is attempting to prevent farmland run-off from entering waterways. The procedure involves the diking of the lower end of the field where water containing fertilizers and top soil collects. This water is then pumped back to the fields above and reapplied, conserving both water and nutrients while maintaining stream water quality.

While basin plans have projections of land use and population, these estimates are made on a gross scale. "For a metropolitan/regional plan growth patterns within the area must be determined from a social and economic analysis of existing metropolitan development. From this basis, the possibilities of future expansion and the need for new treatment sites can be estimated. These analyses should consider: (a) land use, markets and resource base...and (b) population."⁸

The purpose of the metropolitan/regional plan is to define a strategy which results in the most cost effective solution for wastewater disposal problems within the planning area. The guidelines for metropolitan/regional plans address land use in a more formal way by including: present and anticipated boundary areas of wastewater service for five year periods; present and proposed zoning and other land management techniques; future major collection and transmission systems; and major treatment works and discharge points.

Basin and metropolitan/regional water quality planning activities

in Region VI generally use the 1970 Census as a basis for population projections. The Water Programs Branch gauges the projections individually by Ober's Method. This technique adds flexibility but also gives some perspective as to how reasonable plans are.

The need for a unified effort concerning the implementation of EPA-HUD water quality programs instigated an agreement between the two agencies in September of 1971. The joint agreement concerns EPA's Construction Grants for Wastewater Treatment Works, EPA's State and Interstate Program Grants, EPA's Comprehensive River Basin Planning Grant, HUD's Basic Water and Sewer Facilities Grant Program, and HUD's Comprehensive Planning Assistance (701) Grant Program.

The current status of the EPA-HUD agreement in Region VI is an informal working relationship at the staff level. Region VI felt that any written agreement might cause inflexible restraints at the staff level preventing optimal interaction between agencies. Some confusion does exist as to whether EPA has the authority to disapprove plans based on inadequate or inaccurate engineering and water quality planning techniques or data. A copy of Region VIII's EPA-HUD agreement was distributed to the Federal Regional Council representative, the Regional Counsel and the Water Programs Branch of Region VI. The Regional Administrator has taken immediate action to establish such an agreement in Region VI and is in the process of formulating such a policy at the present time.

The Technical Support Section of the FEDERAL ACTIVITIES BRANCH (FAB) has primary responsibility to administer the regional program implementing Executive Order 11507 for the prevention, control and abatement of air and water pollution at Federal facilities or installations. The order states that Federal agencies will insure that facilities under their jurisdiction

meet established environmental quality standards on a continuing basis, and that EPA will provide leadership in implementing the order by providing technical assistance and advice to other agencies.

Land management policies and land use activities of all Federal agencies including EPA is of major concern to the Technical Support Section. Among the primary responsibilities of the section is that of reviewing land management policies of the Federal agencies. This assistance to other Federal agencies in the review of their policies is only in an advisory capacity.

The section has observed that some of the most difficult to correct water pollution problems are a result of poor land management. These problems include sedimentation caused by erosion of cultivated, cleared, strip-mined and overgrazed land and acid drainage from strip-mined land.

Activities of the section in general areas of land use are divided in the following approximate percentages: urbanization, 2; agriculture, 3; waste disposal, 60; recreation, 12; mineral extraction, 2; transportation, 30; and wilderness, 3.

The Environmental Impact Statement Section of FAB is primarily engaged in the review of other agencies' EISs. It advises other agencies in reducing the negative environmental aspects of projects. There is some concern in the office that its comments may have little effect in altering the projects. Sometimes its comments are included while other times they are grossly changed or disregarded in the final statement.

This office is not a decision-maker but can and does make suggestions to the responsible agency for further study when the proposal may have adverse environmental aspects. Some projects reviewed which will have major impact on land use are Armand Bayou Park land acquisition, Trinity River greenbelt land acquisition, Bayou Des Glaisses, Sabine River diversion,

Tensas Basin, Bushley Bayou and White Sands National Monument.

Some of these projects were believed to be beneficial and the only comments offered were for further discussion on minor points to ascertain the final statement would contain all the requirements under CEQ guidelines. However, when the office believes that a proposed project will have major adverse impact, it urges the responsible agency to further explain both beneficial and adverse aspects of all alternatives.

The approximate percentages of the Impact Statement Office's activities are concerned with the following: urbanization, 20; agriculture, 10; waste disposal, 5; recreation, 20; mineral extraction, 5; transportation, 20; and wilderness, 10.

The EIS office has little interaction with the environmental appraisal process of EPA's Grants Administration. There may be a conflict of interest when the funding office also interprets the environmental effects of a wastewater treatment project without comment of some other party. That there is little formal coordination between the offices is most unfortunate.

Impact statements that address a more comprehensive view of a project require a sophisticated interdisciplinary team to achieve the desired results of NEPA (Sec. 102A). There is a need for a system to utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural sciences and the environmental design arts in planning and decision-making which will have an impact on man's environment.

The few appraisals reviewed by the FAB were sent back to the originating office with several suggestions on general approach and content. Grants Administration reviewed the FAB suggestions and found its comments too critical. This problem could be alleviated by draft review of the documents and better interaction between the offices throughout the form-

ulation of statements. Closer coordination and a better working relationship should be encouraged to insure better EISs on the agency's own projects.

In an attempt to improve this agency's statements and appraisals, FAB has prepared a Region VI inter-office set of "Guidelines for Writing Environmental Assessments" (see appendix A). It is significant that the guidelines include specific mention of land use considerations throughout the document (see *).

The Noise Abatement and Control Program of FAB is staffed by a summer intern who deals with noise as an aspect of comprehensive environmental management. EPA can affect noise control only through the EIS review process. However, few if any impact statements for the construction of airports, highways and other federal projects have properly considered noise as having a substantial environmental impact, even though noise affects the environment, especially land use and human activity, as much as any other form of pollution.

The effect of noise on land use and the human environment is indeed substantial in areas near airports, railways, major highways and even commercial establishments specializing in rock bands. The impact can range from casual annoyance to constant irritation to actual hearing impairment.

Not only does the noise create domestic annoyances but there is some indication that this type of pollution has far-reaching socio-economic aspects which may influence residential moving patterns and property values. Two studies have attempted to measure the loss in property values caused by aircraft noise emissions. ⁹ The investigation revealed that while property values tended to appreciate equally there was some bias in the findings. First the turnover rate in quiet areas was considerably less than that of high noise affected areas. Since appreciation in value is reflected through

sales prices, the appreciation of property in quiet areas was biased downward, which would in effect, make the relationship between noise and property difficult to obtain. Moreover, this indicates that noisy areas are less stable communities than quiet ones.

Progress in noise pollution in Region VI is slow because of low visibility except by those directly affected, lack of state and local noise standards, lack of funds and lack of technical expertise to organize programs.

The MANPOWER DEVELOPMENT BRANCH has indirect effects on land use through the operation of wastewater facilities. Stream pollution and odors occur from improperly operated facilities and are detrimental to many other types of surrounding land uses.

The Manpower Development Branch is primarily concerned with optimum land use of existing facilities. However, on-site inspection of EPA-funded facilities reveals a lack of compliance to the agreement that the local government will adequately operate and maintain these wastewater facilities for three years after construction. To date there has not been a single court action for non-compliance with these agreements.

EPA is trying to insure that the funded facilities are operated in the most efficient way possible. Currently there appears to be a major problem in staffing the facilities and keeping them in the best of operating condition. An estimated 50 percent of the inspected wastewater facilities in Region VI are operating below desired levels of efficiency and, of these, an estimated 25 percent are considered to have major problems of basic operations. The impact of these low efficiency levels affect air and water quality and therefore local and downstream land development patterns.

Wastewater operator schools are part of the solution and are an integral part of the manpower program of EPA. However, even after operators have been

trained, many cities fail to budget salaries which qualified operators would be interested in. As a result, too often untrained men are hired at reduced salaries to operate a highly technical and important service for the community.

CATEGORICAL PROGRAMS DIVISION

Currently the most active and significant land use "effector" in the Categorical Programs Division is the Solid Waste Management Program.

One of the most significant land uses is sanitary landfills. Landfills are the most popular form of solid waste disposal in the Louisiana and Texas area, but unfortunately an estimated 90 percent of these are actually, to some degree, open dumps. For a disposal site to correctly be classified as a sanitary landfill, three criteria must be achieved: a) compaction of wastes; b) daily coverage of waste with clean earth; and c) no surface or ground water pollution.

A significant EPA solid waste program entitled "Mission 5000" has been successful in redesignating potential land use in Region VI. The mission is to close open dumps and convert them to sanitary landfills. Landscaping of the areas allows spent sites to be used for recreation such as golf courses, picnic areas, etc. These areas are generally not suited for construction purposes due to settling. However, their use as open space is common practice.

Through a program of technical assistance, Region VI is trying to assure that proper techniques are being used to operate and manage solid waste disposal sites.

Another far reaching program that will have an impact on future land use is the funding of research in recycling methods. The effect should be reduction of new resource demands and extension of sanitary landfill

life. Through funding of new recycling technology, EPA may indirectly affect future land use by reducing the demand for virgin materials.

EPA assists urban areas to evaluate optimal solid waste systems that are economical and least harmful to the environment. Solid waste generation, evaluation of on-going disposal practices in the area, alternative disposal practices, optimal transportation modes and routes, and air pollution control requirements for incinerators are discussed in comprehensive plans.

ENFORCEMENT DIVISION

The Enforcement Division has tremendous potential for affecting land use in Region VI and has done so in the past. Its primary mission is to evaluate current compliance, establish goals and priorities for improving the degree of compliance and select strategies and techniques for achieving improvement. The Enforcement Division provides data needed to determine compliance status, to support enforcement actions and to determine the need for nonlegal and/or legal corrective action. One of its main responsibilities is to collect samples and other evidence required for legal action.

The PERMITS BRANCH reviews 1899 Refuse Act applications and arranges investigations by the Surveillance and Analysis Division. The EPA staff interfaces with the Corps of Engineers, River Basin Planning groups and state agencies and recommends project alterations as necessary. Before projects such as maintenance dredging, installation of submerged pipelines or marina construction can begin, each applicant must submit an application to the Corps of Engineers requesting a permit. The permit must be reviewed by EPA and include all pertinent information about the project that could even remotely affect the water quality of the area.

Ideally, aerial photographs or land use maps are included to give those reviewing the permit a better idea of the project's implications on local development and water quality.

The staff also interfaces with the Bureau of Sport Fisheries and Wildlife to determine possible detrimental effects on the local ecology and then recommends practical ways of altering the plan to minimize negative environmental effects. The permit is then issued with EPA's recommendations incorporated in the permit specifications and construction guidelines.

The land-water interactions associated with the many projects that this office comes in contact with are quite visible. An example of the type of "optimal land use decision" techniques being employed by this office includes a case involving the disposition of a "mountain" of gypsum immediately adjacent to the Mississippi River. The material would have obviously ended up as a water pollutant as the whole area was susceptible to flooding and high rainfall. The direct effects of the material could have had substantial impact on the aquatic and plant and animal life downstream. Indirect effects on the land use downstream from a large amount of gypsum slowly washing into the river might easily include altering the recreational potential of the land adjacent to the river for great distances from the original source.

The permit was refused and an alternative was later presented by the applicant for EPA's consideration. The company disposed of the unwanted material inland from the 25 year flood plain. While the decision to locate the material on the inland site was perhaps not the ideal use of that particular parcel of land, it was the alternative which provided the fewer externalities in relation to environmental degradation.

The Permits Branch is also involved in the fill and dredging operations for the creation of land for residential development.

The ENFORCEMENT BRANCH has an important potential for affecting land use through its issuance of 180 day notices and in following up on noncompliance on the part of the polluter receiving one of these notices. Enforcement action can include EPA's withdrawing its certification of Adequacy of Treatment. This certification is necessary before HUD can grant money for projects such as Model Cities and Urban Renewal.

In the first enforcement action of its kind, Region VI asked for cooperation of all other Federal agencies in withholding funds from the City of New Orleans on Sept. 20, 1972. Agencies affected include EPA, HEW, HUD, OEO, DOI, DOT, AND LEAA.

In letters to the regional heads of other fund-granting Federal agencies, Busch explained that the City has not acted to correct a situation which is allowing raw and inadequately treated sewage to be discharged into the Mississippi River, thus creating a potential health hazard to downstream communities.

On May 19, 1972, the EPA issued a 180-day notice to the City for violation of water quality standards. An informal hearing was held in the City on June 9, at which it was recommended that New Orleans proceed immediately to finance and construct waste treatment facilities to correct the deficiencies. The City has not moved to correct the situation.

The request specifically asked the other agencies to refrain from granting Federal loans, grants, community development, or any other assistance programs and projects which may contribute to or increase the pollution load being discharged by the City. Busch stressed that the action was warranted under Federal statutes and was necessary to avoid worsening an already critical pollution problem.

The impact on land use from enforcement actions such as this is evident.

FOOTNOTES

1. William D. Ruckelshaus, Memorandum to Regional Administrators, Deputy Regional Administrators, Assistant Administrators and Office Directors, April 5, 1972.
2. William D. Ruckelshaus, "New Questions on Land Use," an address to the National Association of Homebuilders on January 24, 1972.
3. Arthur W. Busch, letter to G. Douglas Hofe Jr., director of Bureau of Outdoor Recreation, July 13, 1972.
4. EIS Lufkin, Texas, WPC-Tex-625, p. 7.
5. EIS Hot Springs, Arkansas, WPC-Ark-305, p. 12.
6. Interview with Darrel Greenwell, acting chief, Air Programs Branch.
7. "Guidelines Water Quality Management Planning" EPA Water Quality Office, January 1971, p. 1-4.
8. Ibid p. 3-2
9. "The Economic Impact of Noise," EPA-NTI-D300.14, 1971, p.22.

TEXAS AGENCIES IMPACTING LAND USE IN THE COASTAL ZONE

PARKS AND WILDLIFE COMMISSION

The Parks and Wildlife Commission administers the state parks of Texas. It prepares and maintains a comprehensive plan for the development of the outdoor recreation resources of Texas. Completed in January of 1966, the plan qualified the state and its political subdivisions for Federal assistance under the Federal Land and Water Conservation Fund Act. Nearly \$8 million in Federal funds have been allocated to Texas under this program.

Another result of the plan was a constitutional amendment approved in November of 1967 creating the Texas Park Development Fund. The fund derived from the sale of \$75 million in Texas Park Development Bonds is to be used in acquiring and developing new park sites.

TEXAS WATER DEVELOPMENT BOARD

The Texas Water Development Board administers the Texas Water Development Fund which provides financial assistance and aid to various political subdivisions in the conservation and development of the water resources of the state.

The TWDB also prepares a comprehensive state water plan and provides technical programs related to water availability, water quality protection, reclamation and water-related services.

The board's Texas Water Plan includes a definition and designation of river basins and watersheds as separate units for purposes of water development and interwatershed transfers. The scope of the planning program has encompassed all water resources available to Texas and has included the consideration of possible importation. Matched against these sources have been projected water requirements for municipalities, industry, agriculture, recreation and other users.

Voters narrowly defeated a proposed constitutional amendment in November of 1968 which would have authorized \$3.5 billion in Water Development Bonds.

The Surface Water Division conducts surface water data-gathering programs and administers topographic mapping programs, conducts, updates, and refines hydrologic studies for water planning purposes; evaluates proposed alternatives of water development projects; conducts and participates in bay and estuary studies; evaluates effects of waste discharges and reservoir impoundment on surface water quality as these affect the TWP; and conducts climatic studies to include consideration of droughts, floods, evaporation rates and hurricanes.

TEXAS WATER RIGHTS COMMISSION

The Texas Water Rights Commission's primary objective is to conserve water in the greatest practicable measure for the public welfare.

The commission acts on all applications for permits to appropriate public waters for beneficial use or storage or to construct works for the impoundment, storage, diversion or transportation of public waters.

The commission creates several kinds of water districts and approves the organization and feasibility of most water districts proposing to construct projects to be financed by issuance of bonds. Most of the larger water districts and river authorities are subject to continuing supervision by the commission.

TEXAS WATER QUALITY BOARD

The board is designated as the basic agency to control the quality of the state waters. The board establishes criteria governing the discharge of wastewater into, or adjacent to, the waters of the state; issues permits for such purposes; holds public hearings on all applications for permits; conducts research and plans toward the goal of developing comprehensive water quality control programs in every part of the state; administers grants allocated to

the state by EPA and funds appropriated by the legislature for the planning and construction of sewage treatment facilities; and makes inspections and investigations necessary in enforcing rules and regulations of the board and to insure the allocated and appropriated funds are being properly applied.

Eleven Field Operations Division district offices located throughout the state determine whether municipal and industrial permit holders are meeting effluent requirements specified by the board. Field personnel make routine investigations to discover waste discharge activities that are being conducted without a permit; make pre-rating inspections to determine qualifications and needs of communities to receive funds for construction of sewage treatment facilities; instigate joint studies and surveys with other governmental agencies into the causes, effects and possible remedies of water pollution; and investigate all sewage treatment plants and facilities.

DEPARTMENT OF AGRICULTURE

The Department of Agriculture functions primarily as the state's agency for enforcement of agriculture laws and provides equal emphasis on service programs for Texas agriculture and consumers. The department serves as a clearinghouse for numerous agriculture-related problems and requests which are under the jurisdiction of other governmental agencies.

TEXAS AIR CONTROL BOARD

Under the Clean Air Act of Texas this board is charged with safeguarding the air resources of the state by controlling air pollution to protect the health, general welfare and physical property of the people and the operation of existing industries and the economic development of the state. To accomplish this, the board is empowered to establish and control the level of quality to be maintained in air resources; to prepare and develop a general plan for the proper control

of air resources; to adopt and promulgate regulations governing air pollution; to investigate possible sources of air pollution; to hold hearings upon complaints or petitions; and to issue such orders or determinations as may be necessary to control air pollution.

STATE SOIL AND WATER CONSERVATION BOARD

The board performs state-level administrative functions incident to the organization and operation of Soil and Water Conservation Districts and administers state responsibilities in the upstream watershed protection and flood prevention program.

There are 187 Soil and Water Conservation Districts comprising 99 percent of the state's total land area. Each constitutes a governmental subdivision of the state. The district supervisors have various powers under the act, including the formulation of regulations governing the use of land within the area to conserve soil and water resources and to prevent or control soil erosion. These regulations must be approved by the landowners affected by the program.

The districts carry out preventive and control measures; conduct surveys and investigations of flood damage, soil erosion and control measures needed; and furnish material and equipment to assist farmers and ranchers in carrying out erosion control, flood prevention and water management operations.

TEXAS INDUSTRIAL COMMISSION

The Texas Industrial Commission is responsible for planning, organizing and operating a program for attracting and locating new industries. The commission also promotes the expansion of existing industries in Texas.

GENERAL LAND OFFICE

The General Land Office (GLO) is the custodian of 22.5 million mineral acres.

The GLO exercises broad powers of judgement and discretion in awarding oil, gas and sulphur leases on the state's river beds and tidelands, including bays, inlets and marginal sea areas.

The Records Division is a custodian of all instruments relating to land titles and it maintains a file of some ten million tracts of land.

Sales and Leasing Division handles easements for pipelines, grazing leases, etc., and is continuously appraising the lands involved to insure top prices for the state from all such transactions.

The Coastal Areas Management Division assists the School Land Board and the Submerged Lands Advisory Commission in the management, control and use of the surface estates in state-owned submerged lands.

The Mineral Exploration and Development Division maintains information on drilling and exploration activities throughout the state and compiles financial and geological data pertaining to state-owned mineral leases.

STATE HIGHWAY DEPARTMENT

The State Highway Department controls maintenance and construction activities under provision of the Federal Highway Act of 1921.

The Planning and Survey Division collects the necessary information for planning to meet the future needs of the highway system.

Determining policy and procedures for procurement of highway rights-of-way, the Right-of-Way Division assists the districts in obtaining land for buildings, detours, drainage facilities and related purposes.

Assisting in the design of all highways constructed by the department, the Highway Design Division consults with and advises the districts regarding preliminary design and location and reviews plans, specifications and estimates for compliance with state and Federal requirements.

The Maintenance Operations Division supervises all functions in maintenance of the highway system. It also handles the acquisition of real estate; the construction of all buildings; landscaping right-of-way and roadside parks; and traffic engineering relative to signs, signals and accident studies. Under the Federal Highway Beautification Act of 1965, this division has greatly expanded its highway roadside beautification program. Additional and expanded safety rest areas, some with lighting and restroom facilities, have been completed and others have been started or programmed.

REGIONAL GOVERNMENT

At one time local governments were self-contained and local problems found local solutions, but, as metropolitan areas evolved, they were characterized by fragmentation of local government. By the early 1960s the Federal government was aware that some urban problems could not be attacked effectively by relatively autonomous local governments acting independently. In 1962 Congress began to require cooperative regional planning by local governments in metropolitan areas for projects partially supported by Federal money.

In response to the 1962 Federal Aid to Highways Act and in anticipation of the Housing and Urban Development Act of 1965, the 59th Texas Legislature provided the enabling legislation for regional Councils of Governments with the Regional Planning Act of 1965. In 1966 the Legislature endorsed statewide planning by creating the Division of Planning Coordination in the Office of the Governor, and in 1969 the Regional Planning Act was strengthened by amendment.

Texas' 21 Planning Regions were established in December of 1968 after two years of study by the Division of Planning Coordination. Factors determining assignment of counties to State Planning Regions included physical proximity of population concentrations to major urban areas; natural resources; agriculture; manufacturing; social characteristics; commercial and communication links; public services; and current planning, market, service and other districts proposed or operative within the state. Within the 21 Planning Regions there are 24 Councils of Governments which serve the entire state.

COGs are recognized as political subdivisions of the state and are authorized to conduct a comprehensive planning process for the communities and region and to provide services to member governments by contract. COGs have no authority to levy taxes, pass ordinances or otherwise regulate the member governments.

An increasingly important responsibility has been the review of proposals for Federally funded projects to determine their consistency with regional plans.

ALAMO AREA COUNCIL OF GOVERNMENTS

The Alamo Planning Region consists of 24 counties and is comprised of the Alamo Area Council of Governments (AACOG) and the Middle Rio Grande Development Council.

AACOG was formed in 1967 by 11 counties (covering 11,000 square miles) to effect a joint planning effort. Membership by any governmental unit is voluntary, and policies are established by the elected officials who represent each of the member governments. AACOG provides functional and comprehensive social and environmental planning.

A land use classification system that can be adapted to the specific level of detail needed by various public and private agencies is being planned. A handbook will be developed that aggregates the findings and recommends an appropriate standard system or the development of an alternative system.

AACOG also will compile natural and environmental land use characteristics from existing sources which will result in a comprehensive series of regional base maps.

In open space planning, AACOG is conducting studies on utility easements as green areas. Public awareness and support are needed to locate specific sites, generate financing and implement the development of corridors and open spaces. AACOG also plans a study on historical preservation in the region.

Existing environmental planning efforts will be continued to evaluate the impact of physical growth and development on natural resources of the region. Three major plans are currently under development. The San Antonio River Basin study will form the basis of the region water quality plan and is already serving as the interim plan for the development of a regional wastewater dis-

posal system. The final product of the region Water, Sewer and Storm Drainage Plan will enable citizens to trace the utilization of the region's water supply from rainfall to its ultimate disposal and to base decisions concerning the utilization of water on alternatives now being proposed. The initial emphasis of the Regional Solid Waste Management Plan will be to help achieve intergovernmental cooperation in site selection criteria, site operations and equipment sharing. The ultimate objective will be to develop a solid waste management system as part of the environmental planning process.

The staff will continue to review all Federally funded projects which go through AACOG and to provide technical assistance to member governments concerning environmental planning. A 1974 objective is the development of a study methodology to simulate the responses of the environment to alternative land use patterns utilizing the physical land data file and environmental inventory.

A multi-modal transportation planning process is being initiated on a regional level. After basic data has been gathered, transportation specialists, consultants and citizens will analyze the land use, social, governmental, economic and transportation data and recommended goals for the development scheme which will include an ordering of priorities.

Three main housing objectives have been set by AACOG for 1972: (a) to expand the development of the program by the formation of housing subcommittees in the counties, forming links with the rural localities for data gathering and program guidance purposes; (b) to use the housing and industry profile computerization and updating to lay the groundwork for a Regional Housing Development Plan, and (c) to study the high cost and low revenue of residential development as it pertains to school districts as well as to the lack of uniform building codes throughout the area.

AACOG's A-95 Housing Review process will continue to be a vehicle of

coordination and cooperation among housing agencies and will serve as a major deterrent to duplicate use of resources, inferior workmanship and multiplication of environmental problems. The Housing Review Committee is finishing up a packet of checklists, which will cover all areas of the developer's responsibility and insure proper notification on applications. The packet helps meet Federal review requirements by including an environmental clearance worksheet which provides all information required by HUD on the environmental impact of the project. The same form gives the housing committee the data needed to make valid review.

Health planning's objective is to get maximum use from expenditures to protect and improve the health of the people. This will be done by coordinating activities of the member agencies to minimize duplication. The planning process will consist of identifying problems, establishing objectives and determining their priorities, formulating methods for solution and evaluating results.

The criminal justice program will establish an effective program to improve law enforcement through procurement of better equipment, better utilization of existing resources, and systematic training of law enforcement agents. AACOG works with its member agencies to strive for prompt, equal administration of criminal justice.

Social and economic planning provides decision-makers information on the quality of life in the region. This entails compilation of various types of information: manpower service, preliminary social indicators, population trends of minority groups, industrial activity, regional trade and service centers. AACOG will continue to aid the member agencies in coordinating their economic development.

AACOG is charged with the responsibility of evaluation, coordination, review and comment of all Federally funded projects. AACOG utilizes its various

committees and subcommittees for review and comment on proposed projects and their accompanying environmental impact information.

Any review comments made by a committee on an application are forwarded to the Executive Committee of AACOG for final action. The final review comments are then sent to the funding agency, the applicant, or both.

Through the Application Review Agenda, notification is given of upcoming applications and environmental assessments to be reviewed by AACOG committees. The agenda is mailed to over 3,000 individuals and interested agencies in the AACOG region as well as to other regional clearinghouses throughout the state and nation. Notification is also sent to the various state and Federal agencies. By the time an application or assessment reaches the Executive Committee, most of the conflicts have been resolved through the A-95 review and comment process.

THE ROLE OF LOCAL GOVERNMENTS IN LAND USE PLANNING

Zoning and subdivision regulations are the primary land use control mechanisms used by Texas cities and counties. Essentially, they are structured after the original state enabling legislation of the 1920s.

Zoning ordinances are accepted forms of local police (regulatory) powers. They are designed to promote safety and health and to protect property in developed areas from intrusion of non-compatible uses.

Houston, the largest city in Texas and sixth largest in the U.S., has no zoning ordinance. Its growth and development is regulated by deed restrictions. Every other major city in the nation depends on zoning for control. Attempts to pass a zoning ordinance have been repeatedly defeated and it is probable that the city will never have a zoning ordinance.

Subdivision regulations are directed to the control of newly developing areas and the protection of public investments in facilities and services. Any proposed division of undeveloped land for purposes of more intensive use or sale is subject to approval by the local government. State enabling legislation has provided for a greater degree of participation by county governments in the use of subdivision controls than is the case with zoning.

Other types of land control may include fiscal zoning, building and housing codes, and capital improvement programs. Local government taxing policies were not intended as land use control devices, but such fiscal zoning practices tend to create market forces which often over-ride previous land regulatory efforts. Local, state and Federal capital investment decisions and many private developmental activities are examples of other actions which strongly influence land use.

There is an absence of effective regulatory authority over development in unincorporated areas. Although cities have been granted the authority to extend subdivision ordinances to their areas of extra-territorial jurisdiction, the actual application of such powers has proven inadequate. Planning by counties in areas outside the jurisdiction of cities has been almost non-existent.

Counties and other units of government do not have professional planning capabilities within their staff organizations. The need for close coordination between planning and regulatory activities will require that these governmental agencies which have significant responsibilities for land resource management and regulation engage in appropriate planning work.

The Land Resource Management Committee of the Texas Urban Development Commission (TUDC) has recommended that the basic enabling legislation which gives municipal, county and other local governmental agencies their basic authorities for land use planning and regulation be restructured.

The present zoning and subdivision controls are aimed primarily at prescribing uses and development standards for smaller, individual land parcels. TUDC found that they are relatively inflexible and "cannot be applied very creatively or efficiently in the regulation of large scale developments which may encompass a wide range of related or simultaneous developmental uses." The traditional types of land use controls provide little incentive for the private developer to attempt more efficient and imaginative approaches to large scale urban development.

Assistance within the community is a function that should be greatly strengthened at the local level. The local government is the most accessible and readily available point of contact and source of assistance to the individual landowner or developer. For this reason its capabilities to adequately respond to this need should be significantly strengthened. The availability of

assistance and guidance to the private sector can serve as an incentive for co-operation in attaining broad public objectives and specific planning goals.

It has been suggested by several studies that a single administrative agency to coordinate the presently fragmented functions of planning commissions and departments, building officials, boards of appeal and related activities is needed to resolve differences and conflicts, both between the local government and private interests, and among differing private interests.

There should be a high level of citizen participation in planning. The interpretation and application of policy objectives of the local land use plan should be guided but not entirely developed by professionals. The values and needs of a cross-section of the community should be reflected as well.

Dallas has made an excellent effort to involve its citizens in developing a plan for the metropolitan area. The Department of Planning and Urban Development divided the city into traditional communities and then further into neighborhoods. During Phase I, officials promoted a public meeting in each community, and gave a visual presentation of existing facilities in the community, neighborhood by neighborhood. The people discussed what they would like to have in the community and neighborhood and elected a Neighborhood Design Committee (NDC). Over the next few months the planning department proposed ideal land use while conferring with the NDC.

In Phase II, the planners and NDC took the resulting plan back to a public Meeting. The plan was explained and after free and open discussion guidelines were established. A recent, successful bond issue was developed from these neighborhood studies. Socio-economic aspects were taken into consideration and in West Dallas--divided into four neighborhoods--services were provided first.

Currently the NDC reviews the plan revised in the public meeting and then submits it to the Planning Commission. The commission approves it and passes it

to the City Council for final consideration. The planning department would like to develop a Phase III so the plan can be taken back to the people after revisions are made and then to the Planning Commission and City Council. This process will be repeated periodically to keep the neighborhood plans up to date.¹

The local independent school district, hospital district, junior college district and other special purpose governments make many land use decisions which have significant impacts on development patterns in their respective municipalities. If these decisions are made independently without the knowledge of the affected city or cities, there is little chance that a comprehensive development plan can be effectively implemented.

Special districts outside the jurisdiction of cities also create problems. Special districts possess the basic powers of governmental units including the power to tax, to incur debt and to take property by eminent domain. Texas had 1,001 special districts in 1967 and 1,681 in 1971. The proliferation may be explained by the advantages of forming special districts: (1) easily formed; (2) can straddle state, county or city boundaries; (3) formation threatens no other government; (4) circumvents archaic constitutional and statutory tax and debt limits; and (5) highly flexible in area served and functions performed.

Some of the typical special districts include: 339 Water Control, Improvement and Supply Districts; 208 Housing Authorities; 190 Soil and Water Conservation and Reclamation Districts; 56 Drainage Districts; 42 Hospital Districts; 34 Levee Improvement Districts; 25 Navigation Districts; 4 Rural Fire Prevention Districts; and 3 Noxious Weed Control Districts.

Louisiana had only 334 special districts which include: 90 Drainage Districts; 57 Housing Authorities; 46 Waterworks Districts; 34 Hospital Service Districts; 25 Fire Protection Districts; 24 Sewerage Districts; 21 Recreation

Districts; 15 Levee Districts; 10 Port, Harbour and Terminal Districts; 6 Community Center and Playground Districts; 5 Watershed Districts; and 4 Bridge and Ferry Authorities.

Critics claim that special districts are undemocratic, uneconomic and cause functional disintegration. There is some justification for these charges. Special districts diffuse responsibility for performance of local public functions and duplicate efforts. They often lead to extravagance in expenditure and make comprehensive solutions to local problems more difficult.

An example is Harris County which has 149 taxing governmental units--30 cities, 23 school districts, 2 junior college districts, 88 water districts and 6 county-wide units. The Tax Research Association estimates that more than 50 municipal utility districts are in the process of formation in Harris County.

Since 1949, 58 water districts have been absorbed by Harris County cities which assumed special district debts totaling \$52,395,500. Houston assumed \$44,754,500 of that total. Of the 204 water districts in operation in 1971, 97 had an outstanding bonded indebtedness totaling \$174,073,000. An additional borrowing authority totaling \$162,620,000 is in unissued bonds.

The state must take greater interest in controlling the creation of new special districts and supervising the operations of established ones. However, local governments--whose inability to furnish needed services contributes to special district growth--must be strengthened. Counties and other units of government must be given the authority to do planning and this must be carried out--as at all other levels of government--with a significant amount of citizen participation.

FOOTNOTES

1. Interview with Charles Minkler, Department of Planning and Urban Development, July 17, 1972.

CITIZEN PARTICIPATION IN LAND USE DECISIONS

In our democratic society each citizen has a voice in the decisions made by his government, but increasing urbanization and technical complexity have made effective citizen involvement more difficult. Ironically, as the difficulty increases the importance of including citizen views has also risen. Many authorities now believe that only through citizen participation can many of our problems be solved.

Concerned individuals have banded together to insure that citizens have the opportunity to speak and that these views are seriously considered. Thousands of citizen advisory groups ranging from semi-official bodies to self-organized groups have been formed in the past few years.

Thanks to NEPA, citizen participation is now required on public projects but often such input is seemingly ignored. Some officials attempt to get around the spirit of NEPA by constructing massive projects in pieces (see North Expressway case study), and still others insist on building a project no matter how much opposition is aroused (see Wallisville case study). The Corps of Engineers is often accused of disregarding citizen views.

In one project a report by a district engineer was withheld from the public because it raised serious doubts about the value of the project (see Wallisville case study). Col. Vernon W. Pinkey, Tulsa District Engineer of the Corps of Engineers, apparently views the public as something to get around. In discussing the Gillham Lake, Arkansas, project which ran into some controversy, he is quoted as saying "with the proper organization to start with, you could have whipped those birds before they got started." ¹

The views of concerned citizens are being heard. Citizen groups have been able to change projects to reflect environmental safeguards and, in rare cases,

have been able to halt construction which will irreparably damage the environment. In each case the project has received additional publicity and has increased environmental awareness.

However, there is no channel for citizen views into private projects constructed by business and industry without Federal funding or permits, and most of the decisions affecting land use are made by private interests. The proposed land use policy bills now before Congress may solve the dilemma of using private land for the public good. Until some solution is found there is no guarantee that unique natural areas will be preserved for future generations.

In an attempt to gauge the intensity of interest in land use and to survey the amount of citizen input now present in Region VI, letters requesting information were sent to environmental groups, professionals, professional organizations, professors and business and industry.

ENVIRONMENTAL GROUPS

There was a poor response from environmental groups, perhaps because few meet during the summer months. From 121 letters sent there were 14 replies for a return of approximately 11 percent.

Each of the groups reported a few successes in protecting the environment although none were satisfied with the progress. The need for increased citizen participation was recognized but there did not seem to be a simple solution. The New Mexico Wilderness Study Committee suggested that public agencies should spend more money for public education on environmental matters, and the Earth Awareness Foundation (EAF) agreed that education is the key. It said that more citizen participation would be assured if EAF "could educate more rapidly for the highest use principle of land use--not for greatest economic gain."

Other environmental groups believe that participation is a matter of opportunity. The Memorial Earth I Care (EIC) said "individuals do want to be-

come involved...Give them a chance! It's a matter of direction and organization--how to make cohesive this scattered but nevertheless sincere concern." The Clear Creek EIC chapter agreed saying that "citizen input has generally been high; most people are willing to participate in something that will directly affect their lives. To insure citizen participation...allow the people a chance to become involved in the decision-making processes."

The Brazos County Environmental Action Council (EAC) attracts university-affiliated people, according to its president. "We would like more of the businessmen, ranchers and workers of our area to become aware of the problems and interested in working for a change in the attitude of public agencies and institutions," he said. "Citizens must be well informed on all sides of the issues involved and presented with complete facts. Also, to have a truly responsive governmental body would help--one which is not concerned with self-interest and would welcome and encourage citizen input into the mechanism of decision-making--at the grass roots level and not after a position is already taken."

The president-elect of the National Council of State Garden Clubs Mrs. Howard Kittel said the main difficulty in increasing citizen participation may hinge around the time element. Speaking from the experience of testifying before the Forest Service (on wilderness areas), the Bureau of Outdoor Recreation (on outdoor classrooms and nature trails) and the Texas Air Pollution Control Board (on vehicle emissions testing systems), she said that quite frequently time runs out and "you are not called upon at all--or are asked at the last minute to cut a carefully prepared statement to two minutes instead of the prescribed 10 or 15." She believes that as a result the average citizen often leaves such hearings feeling frustrated and wondering if the time and money spent in "going on record" was worthwhile. Mrs. Kittel suggests

that more time at such hearings should be devoted to "actual concerned citizen participation and less to the experts and those with political or industry and axes to grind."

The Texas Committee on Natural Resources promotes land use legislation for Texas and opposes specific "land abuse" projects including Trinity River Navigation, Bachman Creek channelization, Soil Conservation Service channelization projects, Sulphur River channelization (obtained preliminary injunction), Meridian State Park golf course (obtained permanent injunction) and others.

Group Against Smog and Pollution (GASP) has been active in the El Paso area but despite its efforts and success, it is "undermined by the manufacturers and industrialists who come in behind us." GASP members have been appointed to the Citizens Advisory Committee of the Texas Air Control Board.

The Oklahoma City University Ecology Center, an off-shoot of an urbanism class, has established a collection site for newspaper, glass, steel cans and aluminum. The center feels it was a major factor in the city council's recent decision to build three trash recycling stations. A spokesman said that "recycling centers are a means of involving citizens with the city problems in a personal way. Built by the city, they become an 'establishment' endorsement of the philosophy that individuals must cooperate in cleaning up the environment--and they provide a way to do it."

The National Council of State Garden Clubs has been actively involved in promoting environmental awareness for more than 40 years. During the next three years a national effort will be directed toward specific facets of recycling, air, water, land and noise pollution control, preservation of open areas, regional land planning, etc. The clubs believe that citizen input should be increased since it "creates awareness and steps up concern if

nothing else."

The New Mexico Study Committee is a coalition of conservation organizations banded together for the purpose of identifying, studying and proposing new wilderness areas to the U.S. Congress. It realizes that citizen input needs to be increased but less than one percent of the people ever get involved in conservation matters. Activities are limited by lack of money particularly for politically connected actions. Perhaps most disappointing is the inability to keep any appreciable number of young people interested and active in the crusades. "Their attention span appears to be too short. They seem to have been inculcated with the need for instant success. Crusades requiring dogged persistence generally are not much fun."

EAF has found youth support more readily. It has motivated young people in EIC clubs to become more involved in the Armand Bayou Preservation effort. High schools with such clubs include Memorial, Clear Creek, Springwood, LaPorte and South Houston. The young people circulated petitions, sold bumper stickers, spoke to groups about the Bayou and gave slide presentations. As a result, awareness of Armand Bayou has increased and action is taking place to keep the beautiful wilderness area as a natural habitat rather than a proposed residential community.

The Clear Creek chapter made a movie of students enjoying the Bayou and a rock group composed music to be played when the film was shown. The club members participated in nature hikes, publicized the unique character of the Bayou and helped distribute resolutions on "saving the Bayou" to each precinct in the area.

The Memorial chapter organized a recycling project for sixth graders and participated in the Little People's Litter Party by growing plants and making concrete flower bed forms for day care centers. The club is now doing a pilot

project in resource recovery by collecting aluminum and paper on campus. They hope to persuade some civic or governmental agency to set up a complete center for the area.

An example of what citizens can do to aid the environment in a large industrial complex is the Bay Drilling Committee (BDC) in Corpus Christi. The ninth largest seaport in the U.S., the bay and other nearby fields contain 630 producing wells. In the bay directly out from the city and within the city limits there are 80 gas wells and 7 oil wells. There are also seven refineries in Corpus Christi.

Realizing that this high level of production posed a constant threat of pollution, the BDC was formed in 1965 to establish rules by which the oil companies could recover their mineral resources with a minimum impairment to the environment. As a result an ordinance was adopted to (1) prohibit drilling within a mile of the shore, (2) limit the number of production platforms in the bay to three, (3) require a design that would create a minimum of visual effect, (4) establish lighting and safety standards, and (5) require that well heads be clustered.

PROFESSIONALS AND PROFESSIONAL ORGANIZATIONS

From 27 letters sent to professionals or professional organizations, five answers were received for a response of about 18 percent. Four organizations and one individual representing a planning firm replied.

The organizations impact land use primarily in two ways--through legislation or private actions. The American Institute of Planners (AIP) is active on a national and chapter level as an advocacy group with its primary thrust being the initiation of new legislation and innovation in the planning arena. On the local or section level the members individually offer their services and expertise to other agencies and levels of government. Several AIP members

served on the Governor's Committee of Land Resource Management.

The City Planners Association of Texas (CPAT) also works closely in the legislative process. In the last session CPAT proposed a bill to grant cities the power to require the dedication of neighborhood parks (up to 5 percent of gross acreage) as a condition of subdivision approval. Although it did not pass, the bill has a good chance to do so in the next session. The Texas Municipal League (TML) supported and helped to pass the Municipal Annexation Act--a model piece of environmental legislation.

The New Mexico Institute of Chemists has confined its efforts to educational activities. A committee composed of Fellows of the American Institute of Chemists (conferred only on those who have considerable experience and knowledge in their particular field of chemistry or chemical engineering) provides technical information to all concerned citizens or organizations. In its first year the committee referred three people to literature and responded directly to two requests for information. It has also arranged for an NMSU library bibliography of environmental information and plans to donate EPA's "Curriculum Activities Guide for Water Pollution and Environmental Studies" to each high school library in the state. The institute believes that if it can help concerned individuals ask valid questions of industry and agriculture, it will foster a better informed public and an informed public is not likely to make unfounded claims.

Land use policies occupy a majority of CPAT's time but the organization has not yet taken a position on the National Land Use Policy bills. A spokesman for the group said, however, that cities should have the primary land use enforcement powers since cities are closest to the problem. There is some disagreement among the membership whether COGs should be given additional power. CPAT acknowledges a need for better land use controls in areas outside a

city's extraterritorial jurisdiction, particularly with regard to the environment, but state zoning powers probably would be opposed by the organization and many members feel that a statewide inventory of land would be a waste of taxpayer money.

TML believes that competing interests in the coastal zone will have to be regulated--the state has the research capability and the legal authority necessary to establish broad policy and to coordinate planning and regulatory efforts but cities must be included in the planning and regulatory processes. TML advocates extending city land management controls to include authorizing cities to establish and enforce zoning, building and housing regulations to areas of municipal extraterritorial jurisdiction. The application to areas of extraterritorial jurisdiction and the granting of comparable powers to counties, would provide regulatory and enforcement mechanisms sufficient to achieve the desired balance of interests throughout the coastal zone. "Some local governments will not do what is necessary so some requirement for the implementation of a plan should come from the state, but the overall responsibility for the preparation and enforcement of plans should remain at the lowest feasible level of government. Some sort of mechanism at the state level which represents all governmental interests might well be beneficial to resolve disagreements."

Marvin Springer, a successful Dallas planner, belongs to conservation groups and both assists them and seeks their aid from time to time. He believes that citizen input and citizen participation--if informed and well directed--are invaluable in any planning process. However, he said that "if such effort is led by radical, ill-informed persons or by those with hidden or ulterior motives, the process becomes negative, obstructive and sometimes even corrupted." He noted that good citizen participation must be based on a full presentation of the facts, alternatives and opportuni-

ties. "The public hearing process today gives citizens a fair opportunity to participate in the decision-making processes." He stressed that he knew of only a few cases where environmental controversies have had serious direct influence on decisions, but the existence of groups concerned with the environment has made it easier in some cases to achieve solutions which recognize environmental factors.

CPAT disagrees and feels that the input from its members has "certainly influenced" environmental cases. Since it is spread over the state, the organization is not active as a group but individual members have been active in environmental controversies.

Springer says he confers with legislators and governmental agencies concerning environmental problems. "The land use bills that are now in Congress, as I have learned of them, scare me. I have had direct contact and experience with the Federal Government's efforts at housing for one-third of a century. The results have been chaotic and extravagant. I would hope that we could do better with land use controls...we could destroy the innovative genius of our system by excessive control and wind up with some pretty blah urban areas."

Except for overall urban policy and population policy, he believes the local governments should retain land use control. "There is no demonstration of superior wisdom or capacity on the part of state or Federal agencies to indicate that such levels of government could better administer specific local land use controls."

Springer believes there is a need for an overall guiding concept for the conversion of rural or open land to urban use. A national urban policy concerning urban development, urban population distribution and urban services is also needed. He thinks land use controls should be expanded to include unincorporated areas since the "urban fringe permits a proliferation of land use problems in an ever expanding manner."

ACADEMIC

From 57 letters to college and university professors, replies were received from 15 for a response of approximately 26 percent. Most of the professors reported that class assignments are related to the environment and many teach classes concerning conservation or ecology exclusively.

Nine professors endorsed the idea of using classes to contribute to Environmental Impact Statements although one qualified his approval to read, "if such a project were feasible, showed promise of educational and social values and the students received due recognition for their efforts."

James Sciscenti, professor of anthropology at Southern Methodist University was unsure how classes could contribute to EISs. "Statements should be prepared on the basis of field research data and analyses by professional specialists in archaeology, botany, zoology and paleontology, etc.," he said. "EPA might consider funding summer field programs with a class working under a professional for collection of data on specific projects."

On the subject of citizen input, Dr. John S. Barclay, an Oklahoma State University zoology professor, said, "citizen input per se does not need to be increased. Constructive and enlightened citizen input must be, however. The increasingly severe environmental stresses being generated by society will insure more citizen participation. Insuring the effectiveness of this participation requires the vigorous application of sound research and educational programs to the development of and commitment to a comprehensive and truly ecological approach to society's social, economic and political concerns by all facets of our system."

Clarence B. Sinclair, chairman of the Division of Life Sciences at the University of Arkansas, believes that citizen input needs to be continued, but "it must be by informed, accepted citizens and not by long-haired 'greasies'"

that only irritate those in charge of things. To insure more citizen participation is very unsure at best."

Sciscenti believes that professional input by scientists is even more necessary than citizen input. "Scientists generally ask for intensive and competent studies before a decision is made to proceed with a project," he said. He said the environment would be served, however, by offering a reward to citizens who spot pollution or violations of NEPA--similar to the IRS procedure. He also recommended that student fellowships be offered during the summer for research on violations of Federal environmental statutes.

Frederick R. Gehlbach, an associate biology professor at Baylor, said that "more participation could be achieved with state and Federal agencies more actively using citizens on advisory boards and in 'watch dog' capacities."

J.D. Dodd, a range science professor at Texas A&M University, believes "we must make available to the decision-making body all available information...in lay language and properly interpreted." This information must be available to all parties concerned.

An associate professor in forest science at A&M, David M. Moehring, believes that citizen input needs to be increased, "but citizens must have an attentive listener." He noted that "environmental quality is a concern of many citizens, but their cries are often unheeded by the decision makers. Until realistic attitudes of economic growth and economic health are developed among the citizenry and government, the environmental crisis will continue imbalanced and action to correct it will continue to be deferred. When it hurts the pocketbook, people will involve themselves."

Richard J. Baldauf, professor of wildlife science at A&M, said, "citizen input must be increased and this can be done by making all

environmental matters public affairs and by forcing citizens to take a stand on a particular issue after all evidence is presented in open forum.

There must be a constant program in environmental education for all segments of our population. Too many informed academicians choose to be apart from environmental controversies; this action may be due to job security (both real and imagined) and to the fear of being wrong. The problems facing a state employee (and especially one at a university) expressing views on environmental matters are unbelievable!"

Sciscenti experienced similar problems at SMU. He said, "the university administration, because of close ties to the Dallas business community, does not foster environmental concern; ruled against offering an undergraduate major in ecology; does not recycle waste paper; and does not encourage faculty to 'blow the whistle' on elements in the Dallas business community which act in a socially or environmentally irresponsible manner."

Jim Gardner, an A&M urban and regional planning professor, also thinks that academicians should be more involved because they "have something extra to offer in many of the areas of concern. Citizen participation can most likely be increased through more political emphasis and ultimately in education programs."

J.H. Hinojosa, head of the department of urban and regional planning at A&M, suggested that the municipalities, states and/or Federal government should have an environmental quality ombudsman to organize and channel civic action. Non-profit citizen organizations should be given operating funds to cover expenses incurred while serving the community. Since the community is to benefit, the community should provide incentives by defraying legitimate costs of conducting and maintaining an environmental vigilance."

He also suggested a mechanism which would allow continuous public response

to influence policy decisions without incurring undue political pressure. As an example he suggested that local newspapers publish results of regular secret ballot referendums that take the "pulse of the community" on critical environmental issues. Politicians, councilmen, etc., would read the results as trends for more responsive public decision making.

Most of the responding professors reported that they were engaged in environmental research. Barclay is studying the influence of land use on natural resources management and planning--the ecological effects of large reservoirs and farm ponds on waterfowl populations. Sinclair is doing research in the area of water ecology on a reservoir prior to operation of a nuclear power plant.

Dr. C.D. Dowell, a professor in recreation and parks at Arkansas Tech, is directing courses for the Youth Conservation Camps in the Ouachita National Forest and his students are quite active in environmental affairs. Under a \$15,000 HEW grant, the department produced two land use slide-tape documentaries. "We are hopeful 'grass roots' support for land use controls on an interstate level can be generated for the entire Arkansas River Basin."

Gehlbach is conducting research on vertebrate ecology and behavior, and Dodd is studying grassland ecosystems. Moehring is analyzing tree and forest growth in relation to environmental factors and man's modification of such factors. Baldauf's interests range from aquatic biology and vertebrate morphology to environmental education. Gardner's field is urban growth and renewal, and Hinojosa is directing the work of two graduate students on a research study looking into the improvement of urban environmental quality by seeking the types of data and priorities citizens perceive as pertinent to better decision-making by local authorities.

Carl H. Oppenheimer, director of the University of Texas Marine Science

Institute at Port Aransas, is engaged in research on the total estuarine environment including management criteria. The institute works with the private sector (industry), state government, Federal agencies and local organizations. It also carries out an active teaching program. "Our output is in the form of reports, as a consequence of specific projects; presentation at scientific meetings, local civic groups and public hearings; and in contributions in recognized scientific journals."

John R. Hammond, assistant professor of regional planning at the Louisiana State University-New Orleans, said he was working informally with a number of New Orleans organizations analyzing the impact of interstate expressways, Corps of Engineers projects and land development on the marshlands surrounding the central city. "We are very concerned that rampant, uncontrolled urbanization--which has characterized suburban growth in our area--will irreparably damage the natural ecosystem and simultaneously create financial hardships for new homeowners and local governments."

Lee Rodgers, a regional and city planning professor at the University of Oklahoma, said that students in the planning program are involved in environmental affairs in numerous ways--through internship programs, field studies and structured academic courses in environmental policy issues.

George K. Herbert, associate professor in the UT school of Social Work, had his class design social service delivery systems for a proposed "new town" on Lake Austin. The project emphasized the human and humane consequences of land use planning. "Land is a resource with potential for better living on a more humane scale," he said.

Sydney C. Regan, director of the Institute of Urban and Environmental Studies at SMU, said the institute's efforts have been in research and in public conferences. The institute received a HEW grant to do a research

project on community education on the environment--Town Lake Environmental Awareness Study. "More controls are needed in order to make better decisions in the public interest," he said. "This is especially true in the areas of green space and highways and public lands."

Sciscenti has been the principal investigator of interdisciplinary (archaeology, botany, zoology, palentology) teams collecting basic data for preparation of an EIS on Aquilla Reservoir (Corps of Engineers), on Lake Monticello (Texas Utilities Services) and to abstract current information on the Trinity River Basin (Corps of Engineers). He is also conducting research on current inadequacy of data for preparation of impact statements by Federal agencies and failures by review agencies such as EPA to stringently enforce NEPA. "The agency initiating construction ought not to be the agency with the final decision making power as to whether a project should proceed or not," he said.

Hammond believes that more stringent land use controls are essential and that they should be implemented by the state. Barclay also believes that more effective controls are needed. "Today's landowners are essentially the 'trustees' of the natural resources which must sustain future generations," Barclay said. "All agencies and governmental levels should participate in the formulation of comprehensive land use (and other natural resources) planning programs. Implementation probably should be carried out by a state natural resources agency perhaps similar to New York's in coordination with a Federal Department of Natural Resources."

Sinclair believes there are adequate laws in Arkansas to control the environment if they were properly enforced. "There is already too much Federal control on everything, so I am very much in favor of state control."

However, Sciscenti recommended that a Federal agency, "possibly a non-

politically allied EPA", should implement land use controls--"definitely not the state level where pork barrels are rampant."

Gehlbach believes land use controls should be implemented by state and/or Federal agencies as pertinent. Baldauf agreed, saying: "More controls on land use at the state and Federal levels are necessary until people are sensitive to and concerned about the consequences of their actions. It is too complicated to name one agency or governmental level responsible for such controls. Each topic must be treated according to its position in the hierarchy until changes are made in that hierarchy."

Hinojosa said, "incentive mechanisms that maximize individual satisfaction at minimum public cost are desirable. A hierarchy of integrated implementation procedures would seem necessary if local authorities are charged with the responsibility of influencing growth and controlling land use. National, regional and local standards would have to be compatible in order to promote a higher degree of coordination in land use policy and management."

Dodd said, "I am opposed to land use controls, but some form of control is needed and the need will become greater with time. Citizens in each local area must have an input into the controls. There must be regional agencies with overall responsibility and each region established on the basis of land use capabilities and not political boundaries."

Gardner believes that land use controls, at whatever level, will be of little impact if not part of a comprehensive planning process with citizen input and understanding. "Counties should have authority for land use controls, but the state also has obligations for those areas and functions appropriate to it," he noted.

Moehring also thinks that land use planning should be a responsibility

of local and/or regional groups. "Controls for enforcement must be developed and implemented on a national level. But decision making should involve the local citizenry."

BUSINESS AND INDUSTRY

From 15 letters sent to business and industry, six replies were received for a return of about 40 percent. Major companies in the region were contacted before letters were mailed and few were able to name the person responsible for environmental matters.

After receiving an inquiry, Atlantic Richfield sent an environmental lawyer to speak to the land use task force. When he learned that the task force did have the authority to conduct such a survey, he invited the study members to the company office for a briefing. Although no other company went to such lengths, the companies did question the purpose of the study. Many answers were generalities so it is doubtful whether the information gathered from this group will be of real value.

The Texas Forestry Association is a strong promoter of the "wise use" of forests and related resources. The association promotes forest fire prevention and reforestation and since 1944 has served as the state's sponsor of the Tree Farm Program. Its industrial members make multiple use of the timberland by opening the forests to the public for outdoor recreation on the TFA Woodland Trails, as well as supplying the raw material for mills.

The policy of Lone Star Gas is "to be good corporate citizens wherever we are," according to H.R. Crawford, manager of engineering. "We plan to stay aware of the technical developments available for pollution control as well as the legal requirements."

The company has no full-time employee whose major job is land planning, because it feels that planning is a major part of most management jobs. How-

ever, when considering construction/expansion of facilities, the company generally contacts the "local government as well as the Chamber of Commerce during the early planning stages to seek their advice and counsel as well as a determination of their zoning policies and desires."

Crawford said Lone Star Gas selects a construction site after considering the following factors: availability of waste disposal systems; availability of transportation facilities; availability of utilities; soil properties; zoning; and availability of labor.

A Humble official answered the request for information by endorsing the interest in land use, but "I seriously doubt that anyone can be of much benefit to you unless specifics are discussed." He continued: "Land use planning and management is one of this country's most pressing problems. It is also one of the most sensitive, complex and misunderstood subjects. The combinations of factors that must be considered for any single project are immense and probably beyond the intent of the Youth Advisory Board's study. Each project or plant studied or undertaken by Humble is considered as unique. It has been a Humble policy to consider the environment as a very important factor in our projects, even before the current emphasis began to be placed on its necessity."

Mobil Oil replied to the questions a little more specifically. Factors involved in locating a service station include a high traffic count, land cost and zoning, a spokesman said. In a refinery, availability of both raw materials and markets, ready access to key forms of transportation and the availability of labor are the keys.

Mobil's planning department has personnel with backgrounds in economics, manufacturing, marketing, environmental control, exportation and production, transportation and a variety of other experience. Often all of these talents must be brought together to evaluate location and general scope of a facility, he said. "Environmental considerations are a major factor in all decisions

relating to construction or expansion of facilities.

"Permit systems, zoning and local regulations at town, county and state levels require close coordination with the local agencies concerned from a period well before construction starts through actual operation of the facility. We believe in the multiple use concept where an appropriate balance is maintained between the environmental considerations and uses of the land and water that are beneficial to the community and to the country."

Atlantic Richfield won the Gold Medal Award of the Sports Foundation for the best company wide program of water pollution control in 1971. An important factor in the environmental achievements of Atlantic Richfield, according to the Foundation, is "a corporate staff of 10 people trained in various environmental disciplines (who) assist in establishing policy, coordinating company activities and insuring compliance with changing legislation."²

This Corporate Environmental Protection Division advises administrators on environmental matters. Gordon Gallaway, a representative of that division; Ron White, an environmental lawyer; and Seth Abbott, conservation engineer; met with the land use task force to explain Atlantic Richfield's policies. A letter was later received from C.W. Robinson Jr. manager of the Houston refinery, who discussed environmental considerations in production activities.

Robinson noted that "it has always been a policy of Atlantic Richfield, whether in exploration and production or in the location of processing and manufacturing facilities, to operate in a manner consistent with maximum protection of the environment as well as the most effective use of land."

Gallaway said Atlantic Richfield has recognized that environmental protection is a legitimate cost of doing business. "Social costs must be assumed," he said. "We are more involved in social problems."³

"It is our aim to assure not only the most economic use of land, but a

use which is consistent with environmental protection and the public welfare," Robinson agreed. "Environmental considerations are becoming as important to reaching proper land use decisions as are those involving raw material availability, transportation, markets, etc. We fully coordinate construction and/or expansion plans with appropriate local, county, state and Federal authorities through obtaining construction and operating permits as required by law."

Gallaway believes there are no new sites available for a refinery today. "Although built into the system, refineries are the Achilles heel of the industry," he said. "Markets must be close to refinery sites, and we must spend more money on the site to make it more compact. New techniques will call for more equipment but it must be placed in smaller spaces."³

Although the company does not have a "Land use planner," the administrative heads of production, manufacturing and marketing are involved in all land use decisions. They are advised by technical, full-time, conservation representatives at each major facility as well as by the Corporate Environmental Protection Division. Environmental consultants are also used at times.

A staff of 100-150 people spend "100 percent of their time in environmental affairs"--developing and writing good environmental procedures. Guidelines outlining safety practices are distributed to roustabouts since the company believes that most environmental hazards--spills, fires, etc.--are caused by the carelessness of individuals. Some roustabouts have been disciplined for flagrant abuses of environmental safety procedures.

The company also touted its participation in Earth Day, a secondary recovery operation lake stocked with fish and participation in the Anderson Foundation. The company seemed proud of what it had done to protect the environment, but was disgruntled with the Federal government because as Gallaway said, "what's the purpose in collecting data if government agencies do not act on it?"³

When required to do so by local ordinances, the company has been creative in its approach to land use. In Los Angeles wells have been placed underground and inside pseudo-buildings. Operations north of Ventura are carried out from an artificial island which has become a tourist attraction. Drilling, production and research activities are carried out on Rincon Island under the multiple use concept.

Shielded rigs such as these cost at least twice as much as conventional operations, but even the limited practice proves that it is possible for the environment to coexist with the oil industry. The company is also experimenting with shrimp and oyster farms near its Gulf off-shore rigs and operations are halted when whooping cranes come in on the Texas coast.

In regard to the National Land Use Policy Act, Atlantic Richfield believes that: "Although the Federal government may provide guidelines, research, technical assistance and grants, its actions should be without undue restraint and with the purpose of enhancing economic as well as environmental benefits. Its role should not result in control that is detrimental to the public, but should encourage and assist in the development of balanced land use plans. Land use planning and zoning authority should continue to reside in state governments for non-Federal lands."⁴

President T.D. Barrow outlined Humble Oil's attitude toward a land use policy in two articles that appeared in the company magazine, Humble Way. He pointed out that most coastal zone activities which make the area so valuable are carried out by the private sector on private property. Most coastal waters and the submerged lands beneath them are publicly owned, but private development has enhanced their economic value, he said. "When we speak of coastal zone management we are talking primarily about public management of private activities and investment on privately owned land."

Barrow believes that the broadest range of public and private benefits can be obtained through a regulatory philosophy which encourages creativity and innovation in the use of their lands by individual property owners. He said the principal issue is to "provide for many diverse and conflicting demands, both public and private, and still obtain the greatest long-term social and economic benefits."⁵

"The best approach to determining use priorities is indirectly through the institution of performance standards," he said.⁶ "While a specific activity or industry may not be able to meet the desired performance standards today, it may be able to do so in the future."⁷

Implementation of coastal zone management plans should be left to state and local governments and private interests, he said, with financial assistance provided from the Federal level. In the event that the political processes of a single state pose obstacles to the handling of a coastal zone, multi-state action such as interstate compacts may be appropriate, he added.

"The individuality of the coastlines within each state and the varying purposes for which these zones are used seem to dictate the wisdom of a regional or watershed approach rather than a national master plan," Barrow said. "In fact, the management of the coastal zone should be done at the lowest practicable level."⁸

FOOTNOTES

1. DeQueen Daily Citizen, March 29, 1971.
2. "Industry News," Catalyst for Environmental Quality, vol. 2, summer, 1972, p. 35.
3. Interview with Gordon Gallaway of Atlantic Richfield, Aug. 25, 1972.
4. T.D. Barrow, "Private Property and the Coastal Zones," Humble Way, vol. 10, third quarter, 1971, p. 24.
5. T.D. Barrow, "Developing Our Coastal Zones," Humble Way, vol. 10, first quarter, 1971, p. 21.
6. Ibid p. 22.
7. "Private Property and the Coastal Zones," p. 26.
8. "Developing Our Coastal Zones," p. 22.

A list of people who responded to the informal questionnaires is found in Appendix B.

A LAND RESOURCE MANAGEMENT SYSTEM FOR TEXAS

By Joe Harris

Among the fundamental obstacles to achieving an improved quality of life and avoiding further deterioration to social and environmental conditions in Texas are the existing methods of land-use planning and control. There is a demonstrated need to create the capability for a more comprehensive system of land resource planning and management. A coordinated structure of land-use policy at each level of government is the first step in creating such a capability.

The present reliance on a fragmented structure of regulatory measures, exercised mainly by local municipal governments, has proven an inadequate basis for sound land-use planning, management and development. The local government is already seriously strained in its capability to undertake significant new roles in any area of public service. A broadened role of supportive assistance to the local government by Federal, state and regional agencies, along with assumption of responsibility for those aspects of land resource planning and management beyond the means of the local government is the logical solution to this dilemma.

EXISTING PROBLEMS

Some of the apparent weaknesses in existing methods of local land-use planning and control can be traced directly to their dependence upon an antiquated structure of state enabling legislation. The presently authorized regulatory devices and planning powers were simply not designated nor intended to effectively control the large-scale and complex developments which characterize our major metropolitan growth areas of today.

Another weakness lies in the lack of any effective coordination between

planning and regulation. A plan's real value comes from its use as a means to implement public policy and as a guide for both public and private actions.

A third area of weakness in the present structure of land-use control is found in the absence of effective mechanisms for regulating developments in unincorporated areas. Exercise of planning or regulatory practices by counties for areas beyond the cities extraterritorial jurisdiction is practically nonexistent.

Resolving interjurisdictional conflicts in planning and land regulatory practices by adjoining communities is a fourth area of concern. This is a particular problem to communities in the larger metropolitan areas of Texas. There is no effective means of settling these disputes at present short of recourse to the courts.

Other weaknesses may be identified such as inadequate standards to regulate flood plain development, uncontrolled developments around new reservoirs, lack of effective means for reserving open space areas, and poorly defined relationships with other developmental agencies at all levels of governmental organization.

NEEDED CHANGES

The proposed land resource management system has a much broader content and meaning than that associated with existing land-use planning and control practices. The concept of land resource management is that of a flexible and dynamic system of coordinated policies, programs and practices at all levels of government.

The system would provide for continuous policy formulation and reevaluation; comprehensive land-use planning to reflect changing policy objectives; adequate regulatory and incentive measures to accomplish planning goals; standards of resource use based upon performance requirements which maintain and enhance the quality of the environment; and the professionalization of land resource man-

agement capabilities at each governmental level.

Some of the more significant changes and new features of the proposed system of land resource management are as follows:

- (1) Less reliance on an overburdened local government capability for achieving public goals and interests which often extend beyond the local jurisdiction;
- (2) Acceptance of a mutual responsibility by national, state and regional levels to assist and support an enlarged local effort in land resource planning and management;
- (3) Greater coordination at all levels through a process of policy formulation which recognizes the needs and interests of each;
- (4) Organizational changes to strengthen the relationship between major functional activities such as policy formulation, planning, regulation, assistances and arbitration
- (5) Incorporation of more flexible performance standards with which to evaluate proposed development and redevelopment projects;
- (6) More adequate authority and capability for planning and enforcement in unincorporated areas;
- (7) An easily accessible and effective means for arbitrating differences between private interests and government, within government and between different levels of government;
- (8) Comprehensive rewriting of existing enabling legislation to remove the inconsistencies, constraints and built-in fragmentation of local authorizations for land use planning and control;
- (9) Explicit provision for a selected set of the more innovative and flexible approaches used successfully elsewhere such as community development codes, cluster and planned unit development ordinances, design control

ordinances, flood plain regulations, holding, floating and density zoning and new towns;

(10) A structure to facilitate citizen participation in policy formulation, planning and arbitrating function at all levels.

A thorough restructuring of the present practice of local land use planning and regulation by governmental agencies in Texas is recommended.

The continued reliance on local self-determination, with a high degree of citizen participation, would be the foundation of the system. Local governments will continue to carry the primary responsibility for planning and management of the land resources.

The proposed system requires the inclusion and adequate consideration of values and factors other than physical development needs. Historical, esthetic and cultural values are examples.

SIGNIFICANT ISSUES CONFRONTING TEXAS

The identification of key issues and problems confronting levels of government in achieving a unified system of land resource planning and management capability can be organized into several categories. Three principal areas of related issues are Resource Allocation and Use Issues dealing primarily with land resource use, conservation and development, and with implications for the allocation of the scarce land resource to public and private uses; Governmental Organization Issues relating to organization and administration of related land use planning and management practices, programs and agencies; and Private Sector Issues having implications for private rights, free market operations, self-government and other social or institutional adaption.

Five basic functional activities are necessary to implement a unified

system of land resource planning and management. These are (1) policy formulation and revision to reflect the purposes, objectives and criteria of each level of government; (2) continuous land use planning to translate the adopted policy into operational plans, programs and practices; (3) those management and regulatory activities and authorities necessary to successfully implement approved plans; (4) provision and exchange of professional, technical, administrative and financial assurances to insure efficient operational capabilities; and (5) the arbitration of differences, conflicts of interests, and inequities which arise.

STATE ROLE AND RESPONSIBILITY

In order to achieve a greater coordination and unification of land resource management activities at the state level, it is desirable to focus these significant new roles and responsibilities within existing state organizations.

The Governor, already designated as the Chief Planning Officer of the State, should be authorized to begin formulation of a State Land Resource Management Policy. The resulting policy should be heavily dependent on local and regional participation.

The coordination of land resource planning by the state will require an increased capability on the part of the Division of Planning Coordination in the Office of the Governor.

The remaining functional activities--state land resource planning; provision of technical and financial assistance to other state agencies, regional and local units; resource management and the application of regulatory programs and practices; and the provision of an arbitration mechanism to resolve conflicts--should all be delegated to an operational state agency with prior experience and capabilities in these functions.

As the most feasible source of coordination for state activity with those

of Federal, regional and local governments, the Governor's Office should be responsible for receiving and allocating any Federal and state funds available for land resource planning and management programs.

REGIONAL COUNCIL ROLE AND RESPONSIBILITY

Though a relatively new form of governmental organization, the regional Council of Governments (COG) is a vital link in the mechanism of government in Texas. Intended to foster a higher level of local and regional cooperation, COGs are given the authority for planning and intergovernmental coordination of multi-jurisdictional programs.

COGs are already authorized and equipped organizationally to undertake the policy formulation, planning, and assistance functions, given an adequate level of additional financial support. The two functional activities for which regional councils would require some adjustments and new authorities are those of operational implementation through management and regulatory practices, and providing a mechanism for resolving and arbitrating conflicts of interests at the interjurisdictional level.

LOCAL ROLES

A significant level of citizen participation in the policy formulation, planning and arbitration functional requirements is prerequisite to the operation of this system. This can be achieved most effectively and consistently at the local level, though provision must be made at all levels.

The great majority of land resource management decisions are essentially local in nature. These should continue to be the realm of local interests, without undue interference from higher levels. The need at the local level is for a more flexible and coordinated system of public planning and management procedures designed to facilitate and encourage a high quality of con-

tinued growth and development.

A comprehensive restructuring of the basic enabling legislation which conveys to municipal, county and other local governmental agencies their basic authorities for land use planning and regulation is recommended. Much local land use planning is undertaken as a necessary phase of zoning and subdivision regulation, with little or no provision for innovative developments, performance criteria, or the need for protection and enhancement of the natural environment.

The creation of a restructured code for local planning and management of the land resource should come as a by-product of the proposed unified system and not as a forerunner to it. Local governments, as with other levels of government, should begin with a coordinated land-use policy formulation process. In the case of larger cities and urban counties, the process should begin at the subjurisdictional neighborhood or precinct level.

The appropriate policy adopting body, whether city council, commissioner's court, or otherwise, should provide the needed impetus, support and guidance to assure a high level of citizen input into the policy formulation process.

Most cities of any size already have professional planning capabilities in their staff organization. Most other units of local government, particularly the county, do not have this existing capability. The growing need and recognition of the necessity for cities to exercise comprehensive land-use planning and management in their extraterritorial jurisdictions, and for counties to have these capabilities in their unincorporated areas, makes more urgent the adequate provision of professional planning staffs for each local government.

Again, as in the policy formulation function, there needs to be a high level of citizen participation in the planning process. The interpretation and application of policy objectives in local land-use plans, should be guided but

not solely created by the experienced planner. The values and needs of a cross section of the community should be reflected as well.

Day-to-day management and regulatory practices should be keyed to accomplishing explicit policy and plan objectives, rather than mere conformance to a set of specification type standards as presently found in local zoning ordinances, subdivision regulations and housing codes.

The local government is the most accessible and readily available point of contact and source of assistance to the individual landowner, the developer and others most directly affected by governmental intervention in land use decisions. For this reason, its capabilities to adequately respond to this need should be significantly strengthened. A similar requirement exists for the function of resolving differences and conflicts, both between the local government and private interests, and among differing private interests. The existing patterns of local planning and zoning commissions, boards of adjustment and other sources of arbitration have often served more as a bottleneck to the system than as facilitating agents.

LOUISIANA AGENCIES IMPACTING LAND USE IN THE COASTAL ZONE

WILDLIFE AND FISHERIES COMMISSION

This commission regulates all "living resources" and commercial and sport fisheries. It leases state-owned water bottoms; manages refuges, reserves and sanctuaries; and issues permits for underground waste disposal and the development of underground water resources.

The Water Pollution Control Division and the Inspection and Enforcement Division control and enforce pollution laws and regulations. The divisions work with the Department of Conservation's Inspection and Enforcement Division to control oil field brine pollution. Fish kills and water pollution complaints are investigated.

The Seafood, Oysters and Water Bottoms Division is concerned with the management and development of the seafood industry. It grants oyster leases and conducts marine biology research. It handles all leases and permits for shell, sand and gravel dredging and fill work. The division comments on ecological impact of mineral lease applications and regulates seismic activities of the oil industry.

CONSERVATION DEPARTMENT

The Conservation Department creates and enforces administrative policy relative to oil and gas conservation laws. The department is responsible for regulating wastes emanating from oil and gas operations, as well as the drilling, casing and plugging of these wells.

DEPARTMENT OF PUBLIC WORKS

This department provides engineering services for public works and water resource development projects which greatly affect land use and land

loss. Water diversion projects are part of its program.

STREAM CONTROL COMMISSION

The Stream Control Commission has the main responsibility of controlling water pollution.

STATE LAND OFFICE

State-owned lands are managed in large part by this office. It also has the power to lease state-owned lands including water bottoms in certain cases.

DEPARTMENT OF AGRICULTURE

The department promotes economic growth in the Coastal Zone and supervises extensive agricultural lands and marine life and waterfowl habitats. It regulates pesticides, livestock wastes and fertilizers.

STATE SOIL AND WATER CONSERVATION COMMITTEE

The State Soil and Water Conservation Committee improves soil conservation practices. One of its primary activities, the watershed project, is designed to provide more efficient drainage of agriculture lands for flood control and irrigation. In carrying out the project, streams are channelized so water can drain more efficiently. Although the drainage program protects agricultural lands, environmentalists claim the by-product is often the destruction of swamps and marsh lands.

STATE MINERAL BOARD

The board leases and supervises state land for the production and development of mineral resources.

HEALTH DEPARTMENT

The department regulates water pollution which could create serious health problems. It also is involved in sewage treatment programs.

The Bureau of Environmental Health administers PL660 construction grant funds and supervises the plans, specifications and maintenance of wastewater treatment plants.

Solid Waste and Vector Control Section regulates solid waste and its disposal.

PARKS AND RECREATION COMMISSION

The state parks and recreation areas are managed and maintained by this agency.

BOARD OF NUCLEAR ENERGY

Division of Radiation Control regulates radioactive pollutants.

Atomic Energy Development Agency encourages the use of nuclear energy.

SUPERPORT TASK FORCE

The task force encourages the building of a superport off the Louisiana coast. Full evaluation by the Advisory Committee will occur before sea land is bought. The superport will include two ports--one for oil and one for cargo.

COASTAL COMMISSION

The Coastal Commission wants to build an ocean-going ship channel across the southwestern section of the state.

LOUISIANA ADVISORY COMMISSION ON COASTAL MARINE RESOURCES

A newly created commission, it was formed to consider Louisiana's five major Coastal Zone problems: oil well blowouts; wastes from petrochemical industry operations; land-loss and land deterioration due to leveeing, canal-ing, erosion and hurricanes; salt water encroachment brought about by canals, channels and erosion of coastal wetlands; and land subsidence caused by heavy pumping from underground fresh water aquifers. It will, as soon as its Coastal

Zone Management Plan is formed, supercede the Coastal Zone activities of the Wildlife and Fisheries Commission, Department of Conservation and the Department of Public Works. The management plan would include policy guidelines for existing state agencies and propose new laws and regulations where they are needed. In the next year, this will be the most important Coastal Zone agency.

RESERVOIR DEVELOPMENT--WALLISVILLE RESERVOIR

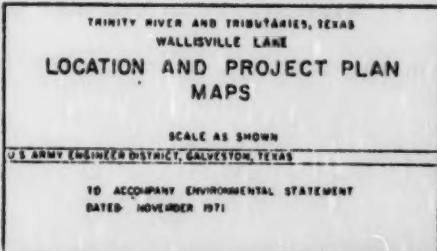
Wallisville Lake, a proposed reservoir on the Trinity River, Texas, illustrates major land use problems in reservoir development (see Figure 1). A Corps of Engineers project, Wallisville, will inundate 19,700 acres of land, only 4,900 acres of which is now water area.

Authorized by the River and Harbor Act of 1962, a low earth dam, 39,000 feet long, will be built four miles downstream from the entry of the Trinity River (the largest tributary spilling into Galveston Bay) to Trinity Bay. The Corps claims in its EIS that Wallisville has five benefits; (1) salinity control; (2) improved navigation; (3) expanded water supply; (4) recreational activities, and (5) fish and wildlife enhancement.¹

The navigation canal will provide transport 49 miles to Liberty; a lock will provide entry into this section of the channel which will eventually extend 300 miles north to Fort Worth. A 9 x 150 feet channel will be dredged and spoil will be put on the higher lands along the channel retained by levees. Siltation and sedimentation from dredging will be temporary.

The lake will raise the water level four feet above mean sea level and average 2.5 feet in depth; after 25 years have elapsed, the lake level may often drop to one foot above mean sea level. Although one of the reasons for building the dam, recreation will be limited to the first 25 years of the project because of the anticipated water level drop. The quality of the sport fishing may be bad initially and remain poor because of a large population of rough fish which will thrive in the lake.

Wallisville is one in a series of projects. Livingston Reservoir, also on the Trinity, stores water for Houston which, after use, flows polluted



into the Houston Ship Channel. The San Jacinto River, the second largest tributary in Galveston Bay was dammed in 1954 and undergoes the same process. If the proposed Trinity River Project (a navigable canal from Fort Worth to Galveston Bay), of which the lock and canal in Wallisville Dam are a part, is completed it will further reduce the fresh water flow into Galveston Bay.²

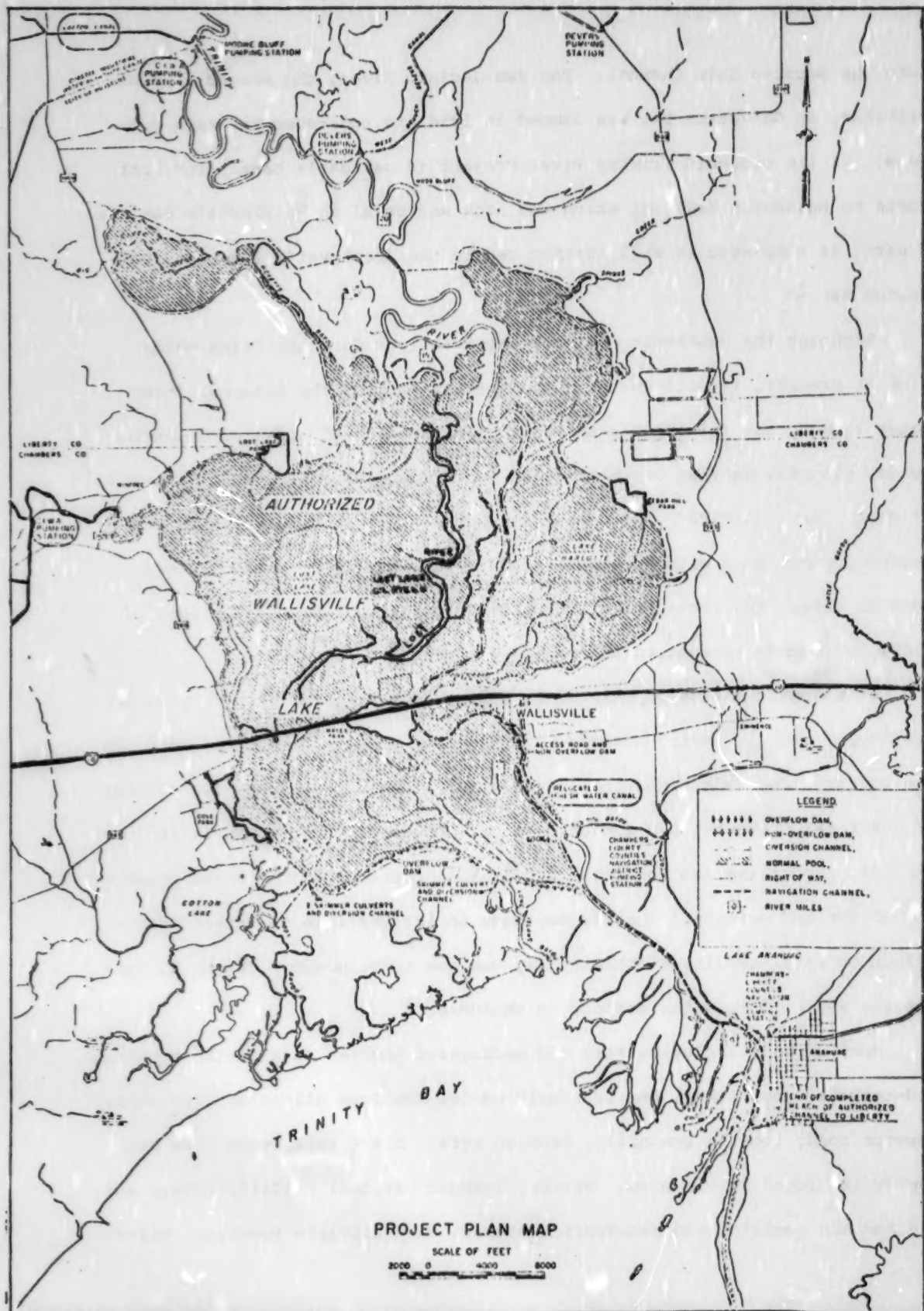
Although the reservoir will not necessarily reduce the fresh water flow at present, it will cut down the greater part of the seasonal fresh water flow to the Trinity Bay and will eliminate 20,000 acres of brackish ponds, sloughs, marshes and bottomland (see Figure 2).³ The U.S. Fish and Wildlife Service (USFWS) believes that much of this is prime finfish and shrimp nursery area with an annual productive capacity of not less than \$300 an acre. The Texas Parks and Wildlife Department predicts a loss of 7,027,000 pounds to commercial fishermen a year.⁴

If the salt intrusion barrier is built, 7200 acres of estuary will be destroyed. In discussing adverse environmental effects, the Corps mentions the estuary loss as a minor one, saying that it only represents 3.2 percent of the total Galveston Bay estuary system. However, Trinity Bay is one of the most productive and commercially valuable sections of the Texas coast for shrimp and oysters. The dam may have an irreversible or irretrievable effect on water quality of Trinity Bay and the total ecology of the Galveston Bay System unless the project is abandoned.⁵

Many animals including rare and endangered species such as the northern red-cockaded woodpecker, American bald eagle, American alligator, red wolf, Houston toad, roseate spoonbill, reddish egret, black rail, wood ibis and osprey are found in the area. Nearby, Anahuac National Wildlife Refuge and the Audubon Society bird sanctuaries attract many wildlife species. Migra-

FIGURE 2

120



tory waterfowl winter in this district.

The Corps expects shellfish and other wildlife to relocate and compete in the other available areas. It is questionable that these animals can find new space and food with 14,800 acres of land and 7,200 acres of nurseries inundated with fresh water.

The Corps believes "there is no reasonable basis of predicting a measurable economic loss to the commercial fisheries" although it received varying reports which did discover predictive basis.⁶ The Corps admitted that an independent assessment group, hired by the Corps to assess the fishing losses, agreed with the NMFS report that fresh water sport fishing will be minimal and fresh water commercial fish will be of low value.

The Corps claims the irrigation potential will be increased, although the Texas Parks and Wildlife Department finds it "difficult to understand how the furnishing of fresh water to rice farmers would enhance our natural environment...The economic benefits to communities in these environmental statements seems overstated and slanted."⁷ Crop controls have already cut the allowable rice acreage from 80,000 to 40,000.

It is suggested that wintering waterfowl will feed out of newly irrigated rice fields, but many reports are coming from this area that geese and other waterfowl have been dying from the consumption of rice seed treated with mercury which retards mold prior to sprouting.

Eutrophication will probably occur as the lake fills because of the nutrients contained in the soil, decaying vegetation and aquatic organisms. The Corps expects floods to periodically flush the lake and alleviate the sedimentation and eutrophication problems. EPA thinks that the "extensive surface area and shallow depth of the proposed impoundment, possible problems in temperature, eutrophication and related conditions

might interest with the quality of the water in the municipal system."¹⁰ The lake will, however, create good duck hunting if the proliferation of aquatic vegetation occurs as predicted.

On September 13, 1971 a suit was filed to halt the Wallisville construction. The plaintiffs are the Sierra Club, Houston Audubon Society, Texas Shrimp Association, Charles L. Petting and Eugene A. Dutton. The defendants are Robert F. Froehlke (Secretary of the Army), Lt. General Frederick J. Clarke (Chief of Engineers, Corps of Engineers) and Col. Nolan C. Rhodes (District Engineer, Corps of Engineers).

Other contentions are that the Corps did not file an adequate EIS under NEPA, and that they are attempting to build the Trinity Canal in pieces instead of filing a statement on the entire project. The Corps claims that there are two separate projects--Wallisville Reservoir and the Trinity Navigation Canal--but General Koish of the Corps does admit that the canal cannot exist without the dam. The plaintiffs further allege that the reservoir would destroy thousands of acres of hardwood and mixed forest and some "Biologically rich flood plain and bottom lands."

Col. Rhodes does not see the Corps changing any of its plans because of the suit. He admitted that the alternatives to the plan were drawn up only "to get it on the record." A confidential Corps report by Col. Harold C. Brown, then Galveston District Engineer, stated that if all went as planned, the lake would be empty 63 percent of the time and large portions of the reservoir would be mud flats. The report was suppressed and Brown was transferred.

The case has not yet been heard. If the Corps wins, all the environmental aspects will be water over the dam. If the Corps loses, it will be a landmark case in environmental protection concerning both dry and sea land.

FOOTNOTES

1. EIS, Wallisville Lake, Trinity River, Texas, U.S. Army Corps of Engineers, (06-1-46, Texas) p. 1.
2. Luther J. Carter, "Galveston Bay: Test Case of an Estuary in Crisis, "Science, vol. 167, February 20, 1970, p. 1103.
3. Ibid
4. Houston Post, September 23, 1971
5. EIS, p. 66.
6. EIS, p. 34.
7. EIS, p. 71.
8. EIS, p. 63.
9. Dallas Morning News, October 2. 1971.
10. Dallas Morning News, September 16, 1971.
11. Houston Post, September 23, 1971.

EDEN ISLES AND PADRE ISLES

Padre Isles, on Padre Island, Texas, and Eden Isles, St. Tammany Parish, Louisiana, recreational-residential developments, illustrate the problems of creating land in the Coastal Zone. Both spoil-filled developments face the problems of erosion, floods, hurricanes, and water circulation around the sites.

With increased leisure time and affluence, more Americans are turning to recreational facilities. Many are being built in "prime natural areas" such as beaches, wilderness and other aesthetically appealing regions. It must be remembered that Eden Isles and Padre Isles merely serve as convenient examples of problems that exist along many parts of our shores.

Eden Isles is located on the north shore of Lake Pontchartrain between Slidell and New Orleans. The development is being built by dredging canals and filling in the fingers of adjacent land. The developer is completing the dredging and maintenance which will include an entrance canal from the lake and a system of connecting canals forming 90 miles of navigable waterways. The lots between the canals will range from 4 to 8 feet above the lake. Bulkheads will be used to help prevent erosion into the 20-30 foot canals. The 5,300 acres of land will represent almost a total community on either side of Interstate 10.

The dredging of canals at Eden Isles which are deeper than the natural lake depths can present serious environmental problems, such as restricted water circulation which limits oxygen replenishment and consequently aquatic life. The dead end canals will be flushed only by rains and high tides; stagnation may occur. Eden Isle's canals have the potential of being sediment traps containing wastes which are oxygen demanding--sewage runoff, plant fertilizers, and solid wastes.

The canals could eventually become anaerobic and the problem could be

accelerated in the summer. Warm water containing less dissolved oxygen could result in massive fish kills. Water front lot restrictions and limitations need to be placed on vector control methods, fertilizers, and other potential water pollutants to avoid further canal problems.

The danger of hurricanes must also be considered by potential residents. In August of 1969, Camille wrecked much of St. Tammany Parish, however, since then more growth has occurred in the area. Camille caused high tides and heavy flooding. Exposed areas along the lake shore were hit the hardest.

Total storm damages were \$4.9 million in the 50,400 acres which were flooded.¹ Between U.S. 11 and I-10, camps were destroyed or damaged by winds and contained an average of two feet of water. Levees protect the areas where Eden Isles is located but these levees were covered with debris that took one week to clear. It is impossible to estimate the extent or effects of future hurricanes in this area.

Padre Isles, on the northern sector of Padre Island between Corpus Christi and Padre Island National Seashore, exhibits some of the same environmental problems as Eden Isles. Like Eden Isles, Padre Isles has not obtained a Section 10 permit for dredging, even though the development is almost completed.

Hurricane protection is provided by a 13 foot seawall on the Gulf of Mexico exposure. The shifting of the dunes into Laguna Madre, often caused by hurricanes and other natural sources, will be minimized because of the development and its plantings.

Canals will be partially protected by a tertiary wastewater treatment plant. Groin traps will catch floating trash at the mouths of the main exists of canals. Sewage sludge will be used for fertilizer.

Wildlife on Padre Isles will be forced back into the National Seashore area which may cause some problems in competing for food and space in the new areas. The filling of marshes will eliminate estuarine activities. However, these losses

are being offset by the widening of the two exit canals at shoal depths to try to replace some of the nursery grounds.²

Dredging and filling to create land for recreational and residential development can cause serious ecological problems. These must be overcome in future projects in order to insure the continuation of the estuary. Filling land destroys brackish and salt marshes which are an integral part of the estuarine system. The marshes, phytoplankton, and plants convert nutrients to organic materials to provide food for estuarine inhabitants. Marshes and submerged flatlands provide food, protection, and nursery areas for many important recreational and commercial species of fish and wildlife. When these areas are destroyed, food species are destroyed and therefore, the indigenous wildlife cannot survive.

EPA has requested an EIS from Eden Isles because of the dredging. EPA's request was directed to the New Orleans Corps of Engineers who suggested a water quality study as an alternative. The Department of Interior gave the Corps a stop work order on August 9 for the area which is substantially incomplete.

The filling of marshlands needs to be regulated either on a state or national level. It is acknowledged that we need recreational areas but this need must be balanced with estuary and wildlife protection.

FOOTNOTES

1. "Report on Hurricane Camille," U.S. Army Corps of Engineers, New Orleans, La., 1970.
2. W. Armstrong Price, "Environmental Impact of Padre Isles Development," Shore and Beach, vol. 39. October 1971, p. 10.

LAND USE MASTER PLAN--PADRE ISLAND NATIONAL SEASHORE

Citing the need for planned recreation areas as the population increases, the National Park Service has developed a Five Year Master Plan for Padre Island National Seashore. It can be followed by others who plan recreational areas for long-term use by many people accompanied by little environmental damage.

Padre Island, 80.5 miles of its 113 mile length authorized as a National Seashore in 1962, is the longest barrier dune island in the U.S. (see Figure 1). It encloses 133,918.23 acres, 20,000 of which are in the shallow waters of Laguna Madre. Boats can approach the island only from public areas such as Corpus Christi, Baffin Bay and Port Mansfield.

Padre Island, itself, is a "textbook example of the mature stage in the development of a coastal plain shoreline of emergence," and has been developing for more than 5,000 years.¹ The width of the island varies from a few hundred yards to almost three miles, varying with the sand shifted by wave and wind action.

Laguna Madre averages three feet deep and three miles wide and, in isolated sections, is hypersaline. Before the Gulf Intra-Coastal Waterway was finished in 1948, the salinity was higher and fish kills occurred frequently. Although the Waterway relieved part of the problem, the causeway to the island restricted water circulation in the shallow flats and siltation grew worse.

Farm-related pesticides spill into the lower Laguna Madre and DDT levels are high, threatening the White Pelican and Great Blue Heron. Other waterfowl such as the Red Head Duck live in the shoal and widgeon grasses, and spoonbills, American and snowy egrets, herons, gulls and terns also reside

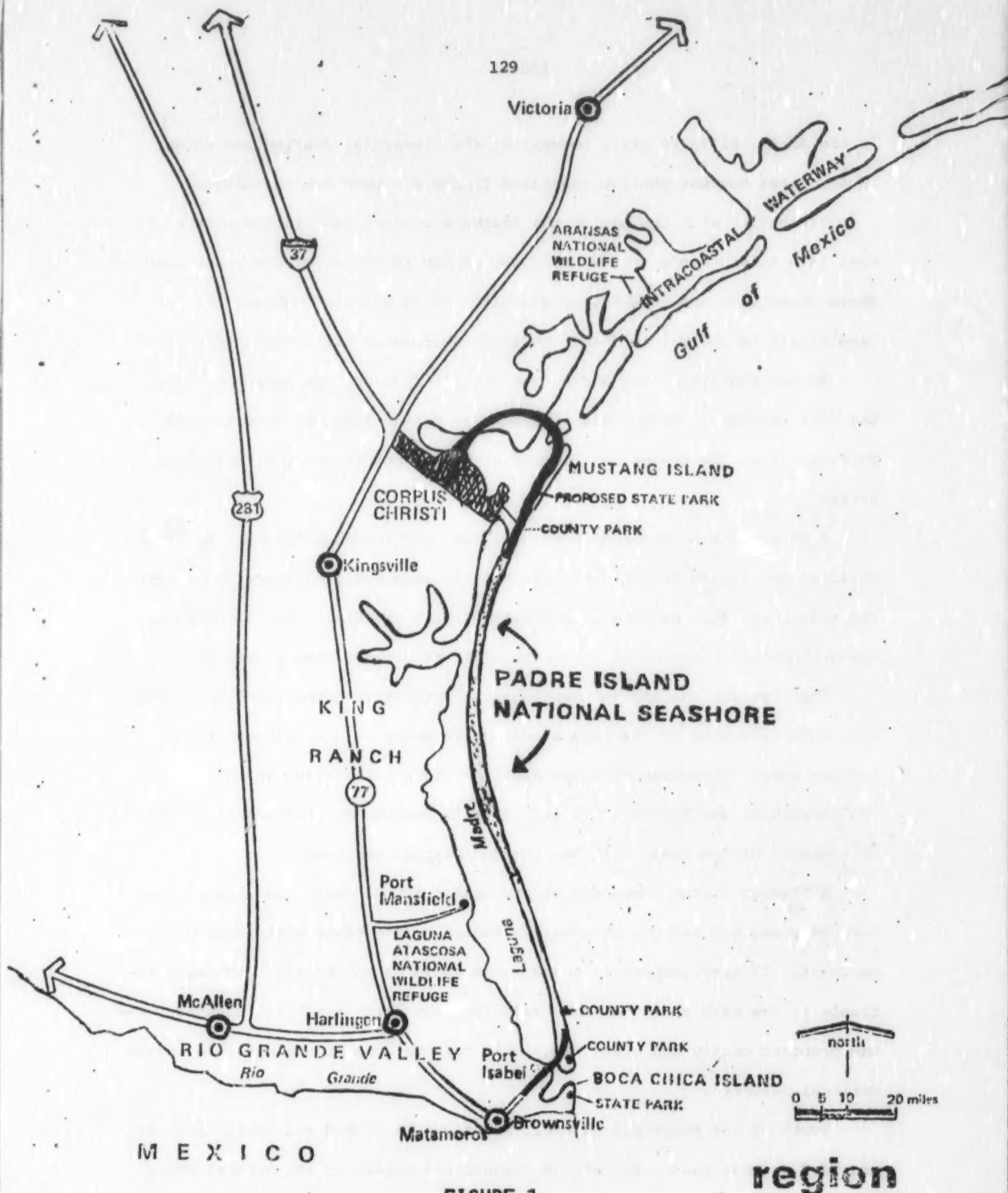


FIGURE 1

in the area. Fifty to sixty percent of the commercial finfish are caught in this area because shallow vegetated floats are used for spawning.

Presently, with the use of the seashore concentrated in the northernmost 14.5 miles, man's traces are found mainly in the foredunes vegetation where consequent dune blowout is visible. It is quickly "moving" the island closer to the mainland and therefore decreasing the Laguna Madre area.

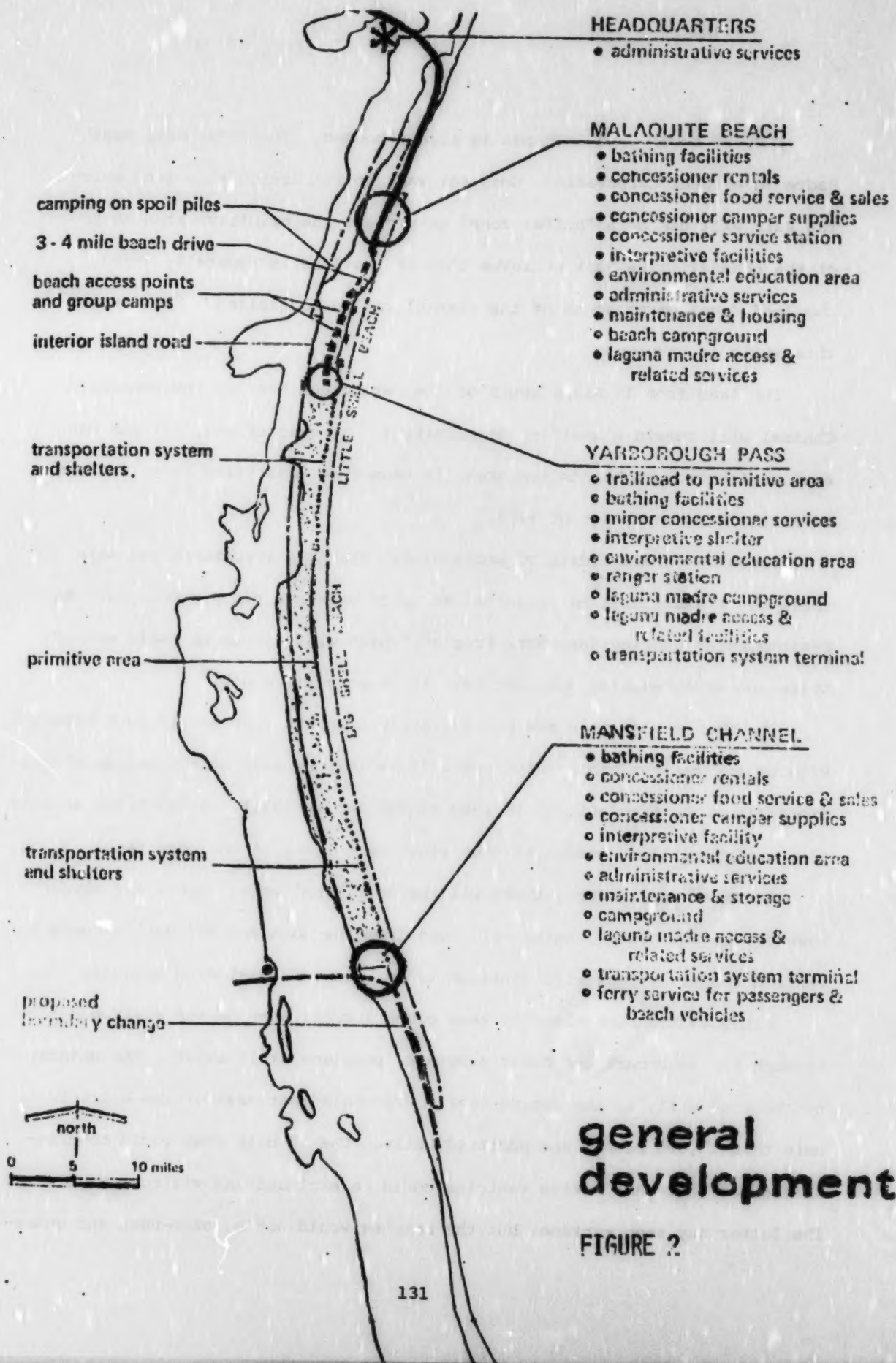
As the shoreline area and Corpus Christi develop, the impact of human use will increase. Padre Isles, a proposed residential and recreational development on the island, will bring even more people needing recreation areas.

A plan is being devised to control the ever increasing human impact by dividing the island into two similar heavily used outlying areas and a center area which will be used less intensively, reserving it for later human use or hopefully leaving it in a natural state forever (see Figure 2).

The plan for the two end sections calls for more development including a 15 mile extension of the road at Malaquite Beach to a trailhead at Yarbrough Pass. This road will travel along old service roads and pipelines, and boardwalks and interpretive devices will lessen the disturbance of the foredunes. Hiking areas will be provided next to the road.

A highway at the lower end of the island at the Mansfield Channel has been proposed but not yet thoroughly studied by the Texas State Highway Department. If environmentally sound, this would be an important southern entrance to the Park and other new roads from the north are being planned. New and proposed county and state parks will relieve some of the pressure on the National Seashore.

South of the Mansfield Channel, boats can be docked and facilities are provided so that land north of the channel can remain in its natural state. This southern development will not be started until the demand is greater.



general development

FIGURE 2

A 2,000 acres land exchange is also proposed. The developer, South Padre Investment Corporation, does not want to relinquish this land which the Park will use as a "buffer zone" to protect the primitive area north of the channel. The Park believes that if the land is Federally owned, the land development south of the channel can be controlled. The fate of this strip is unknown.

The land from 15 miles south of the Yarbrough Pass to the Mansfield Channel will remain classified as primitive. Because of gas, oil and mineral exploration rights in the area, it cannot be classified as wilderness under the Wilderness Act of 1964.

Research on all facets of archaeology, historic structures and sea-shore environment will be conducted so as to preserve these resources. An Environmental Quality Benchmark Program "which will act as an early warning system on environmental degradation," is to be carried out.²

The Master Plan is a new but extremely important concept in park planning; without it, many valuable resources will be lost because of the masses of visitors (increase from 360,802 in 1968 to 904,365 in 1971). A beach bus or similar vehicle will be needed to take visitors to some of the more remote areas.

As more people visit, there will be additional water supply and sewage disposal requirements. Water will come from the mainland and dual secondary waste disposal systems will continue to be used and considered adequate.

Although the Park plans to keep close surveillance on the environment through the Benchmark and other programs, problems still exist. The opening of the road will, in the coming years, overwhelm that area of the beach if more than 10,000 people are admitted daily. The 15 mile road could be eliminated, or four-wheel-drive vehicles could be excluded and visitors regulated. The latter may seem extreme, but the beaches would not be over-used and under-

go ensuing ecological problems. The seashore is a fragile resource and the National Park Service should be commended for its foresight. Nevertheless, it must become stricter in its regulation of human activity.

FOOTNOTES

1. EIS, Padre Island National Seashore, Texas, Department of the Interior, (DE 72-33), 06-2-154, Texas, p.6.

2. Ibid p. 4.

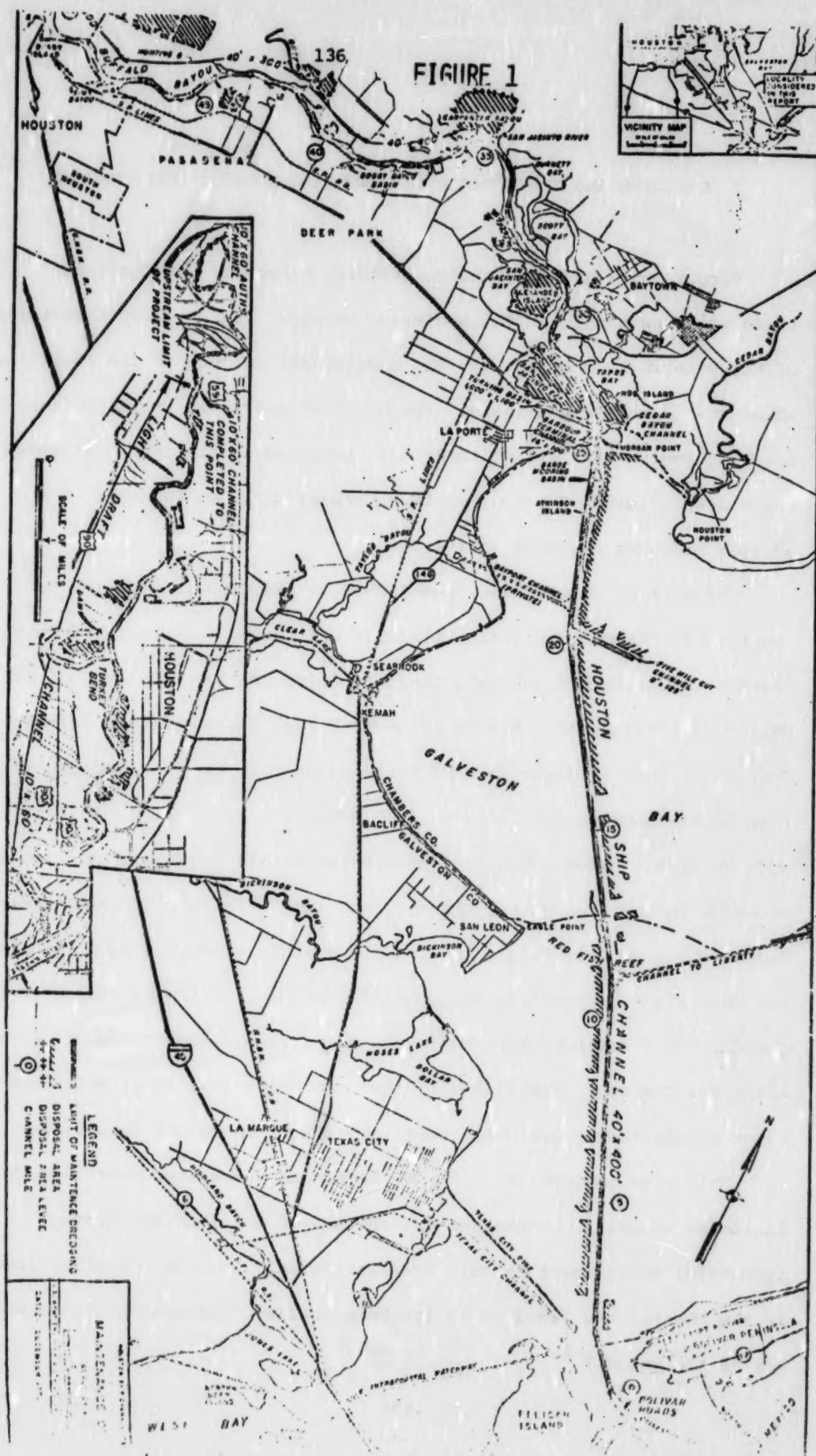
DREDGING AND MAINTENANCE OF CHANNELS--HOUSTON SHIP CHANNEL

Virgin spoil and maintenance dredging occur and will continue to do so along the Texas and Louisiana coasts. The economic importance of the waterways combined with the shallowness of much of the coastline makes this a persistent issue. The Corps of Engineers is the primary dredging monitor and its policies are expressed in its impact statements which EPA reviews. The Houston Ship Channel has been selected as an example of Corps dredging activities.

The Port of Houston was established in 1841 and in 1910 the Harris County Ship Channel Navigation District was formed. The Houston Ship Channel was dredged four years later to Galveston Bay and the Gulf of Mexico (see Figure 1). Almost 60 years later, Houston is the largest deep-water port in Texas and the third largest in the U.S., moving more than 64 million tons in 1970.

Railroads, highways, pipelines, barge canals and ocean shipping all converge in the area of the Channel, and industries of all types center around the area (see Figure 2). All have waste products, many of which are conveniently dumped in the Channel. Because of its proximity to oil fields, there has been much refinery, chemical and petrochemical development along the Channel. Fertilizer plants, cement plants, steel mills and paper manufacturers are among other major representative industries.

This area employs over 100,000 people and generates over \$500,000,000 in income annually. Consequently, the use of the land and further industrial development in this area is crucial, but the pollution level in the Channel has resulted in its being called "the most polluted waterway in the world." ¹



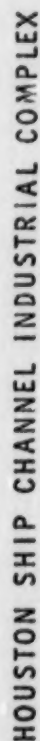


FIGURE 2

In the Galveston Bay system, the marshes and vegetation serve as nurseries and feeding grounds for fish and shellfish. Oyster, shrimp and crab are commercial species in the area, supporting a large fishing industry and fleet. As many as 90 percent of all Texas Gulf shrimp spend some part of their life cycle in the Galveston Bay complex.

The heaviest pollution occurs above Morgans Point and fish and other higher forms of aquatic life rarely appear. The upper part of the Channel contains not only industrial, but also municipal wastes. Anaerobic conditions sometimes exist as far down the Channel as Morgans Point. Nearly one-half of Galveston Bay is now closed to oyster harvesting because of pollution, although the more productive reefs are still open.² It is estimated that shellfishing now loses \$359,000 to \$1,045,000 annually.³

The Administrator of EPA called an enforcement conference on June 7-12 and November 2-3, 1971, on Galveston Bay and its tributaries in accordance with section 10 of the Federal Water Pollution Control Act after finding that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution.

The conference set a goal of 35,000 pounds BOD daily, a third of the existing load. A joint EPA-TWQB facility is now working to identify and quantify municipal and industrial waste discharges into the Houston Ship Channel and Galveston Bay. Sampling is being performed mainly on those industries whose discharge is greater than 500,000 gallons daily or have significant wasteloads.

Funds were made available for the project, although some were contingent on the formation of a regional sewage plan. Work was begun this spring on the project, but if the Houston Ship Channel were cleaned tomorrow,

the pollution would be evident for years because of the two-foot "blanket of putrid sludge" on the Channel bottom.⁴

Originally a Federal Navigation Project, the Houston Ship Channel reaches from Bolivar Road (lower end of Galveston Bay) and the Gulf of Mexico about 25 miles to the northeast through the Bay to Morgans Point. It then goes westward for another 25 miles across the lower reaches of the San Jacinto River and Buffalo Bayou to the Houston Turning Basin.

The Channel maintains a 40-foot depth from mile 0 to mile 47.1 and a 36-foot depth thereafter to the Turning Basin to allow safe passage. Channel bottom widths are 400 feet from mile 0 to mile 38.9 and 300 feet from mile 38.9 to the Turning Basin. Other smaller channels and basins that need to be maintained are parts of Buffalo Bayou, a channel at Five Mile Cut, a mooring basin at Barbour Terminal and a channel in Green's Bayou.

Maintenance consists of removing and disposing of shoaled materials through the use of mechanical or hydraulic pipeline dredges. Proposed disposal sites are on both land and open water. EPA has been influential in changing the Corps' policy of spoil dumping in open water to dumping polluted spoil on the land where it has a less harmful effect to estuarine ecology.

The spoil can provide malodorous effects if not treated. The Corps will treat it for fumes and to aid vector control. The chemical compound which contains essential oils, deodorized kerosene, and an emulsifier was recommended for use by the Director of the Harris County Pollution Control Department and has been used previously with no adverse effects. The essential oils have been approved by USDA for use.

Placing spoil on older spoil areas may result in the loss of some oysters and benthic organisms but should have little effect on the oyster population in general. Spoil piles are unsightly and are usually inaccessible to the public other than by pleasure craft. In the case of the

Houston Ship Channel, islands have been made from the spoil which may be a visual blight but are valuable nesting grounds for birds--particularly gulls and pelicans.

The Corps reports that the ecological effects of dredging on marine life are significant only below Morgans Point where it will disturb benthic and motile organisms (only because no life exists above Morgans Point). Turbidity will be short termed and localized.

Another result of dredging is suspended sediment, loosened as the dredge operates, which, according to the Corps, will "probably have only a minor effect on motile estuarine organisms and phytoplankton productivity because of the high degree of turbidity which characterizes the Bay waters under natural conditions." 5

The suspended sediment often contains toxic materials or chemicals which may harm nearby marine life. Spoil sludge is now being tested for deleterious effects. If found, the Corps will work with EPA to minimize the potential dangers from dredging. This might mean a confinement of deposited materials at a high cost, seriously hindering such measures being taken along the 20-mile reach below Five Mile Cut.

Plans for an extension of the Houston Ship Channel to Bayport have been finalized. Arthur Busch, Regional Administrator of Region VI, EPA; Ernie Fay, a Houston conservationist; a Texas Water Quality Board representative; a Port of Houston representative and a representative from the Corps of Engineers formulated a new plan for spoil disposition. Virgin spoil levees will be built onto the existing spoil island, Atkinson Island, increasing its surface area to 2400 acres and including 9 million cubic yards of spoil. A "natural habitat" will be formed on the island.

The Gulf Coast Waste Disposal Authority, established by the State Legislature in 1969, is also helping to alleviate some of the Channel problems. Serving Harris, Chambers and Galveston Counties, GCWDA's objective is to establish water quality levels which will protect the Bay. It also participates in the PL660 construction grants program by helping Texas match Federal money.

Houston and much of the southwestern area depend on a clear passage. If the Channel is properly maintained, there will be fewer marine accidents, thus protecting the human environment; but the natural environment enjoys few safeguards. A balance between the two must be reached.

There are many possible solutions, mostly long-range, to the land use problems that dredging creates. In the Houston Ship Channel, spoil has created land as islands but it has also destroyed sea land. In long-range planning, sea land must be considered so that marshes and estuaries along the Gulf Coast are not filled in.

Dredging and the placement of spoil is an important issue in these shallow waters where the channels, canals and waterways are of such economic importance. The state needs a comprehensive plan for spoil land. Leasing the spoil land to industry or private developers could provide state revenue. Open space projects such as the one proposed for Atkinson Island should be continued.

Polluted spoil presents special problems which EPA and others are now trying to alleviate. A comprehensive land use plan for all Texas and Louisiana coastal waterways needs to encompass pollution control. The Channel must be cleaned up and suitable uses found for the spoil.

FOOTNOTES

1. Luther J. Carter, "Galveston Bay: Test Case of an Estuary in Crisis," Science, vol. 167, February 20, 1970, p. 1103.
2. Ibid, p. 1102.
3. New York Times, May 11, 1971.
4. Carter, p. 1103.
5. EIS, TEX-Houston Ship Channel, Texas, (Maintenance Dredging) 06-2-102, p. 5.

URBAN FREEWAY DEVELOPMENT--SAN ANTONIO NORTH EXPRESSWAY

The partially constructed North Expressway in San Antonio delineates land use conflicts which may occur when a new highway is proposed. As a result of the conflict surrounding this expressway, legislation is pending that could negate the effects of NEPA in highway construction.

The North Expressway was proposed in the mid-1950s, although no action was taken until the 1960s. It was planned as a Federal aid highway and the Federal government was involved at every step. The right-of-way cost was shared between the state and Federal governments.

In 1967 the Conservation Society, Save Our City, Sierra Club and others filed suit to injoin its construction through Brackenridge and Olmos Parks. A series of court actions followed and presently the expressway issue is before the U.S. Senate. S3751, an amendment to the Federal Highway Act, concerns the right of a state to withdraw its request for federal funds, release itself from federal highway jurisdiction and continue the construction of the expressway with state funds. Texas wants to withdraw from federal regulation because the Fifth Circuit Court of Appeals in New Orleans ruled that the expressway plan is in violation of NEPA and the Federal Highway Act's environmental provision.

Sen. Lloyd Bentsen and Sen. John Tower are co-sponsoring an amendment which will allow Texas to "circumvent Federal environmental safeguards in constructing the controversial expressway."¹ S3751 was favorably reported by the Committee on Public Works on August 17, 1972.

Two years ago Secretary of Transportation John Volpe administratively approved fragmentation of the expressway route into three segments. Construction of the two end segment was allowed to begin. Judicial opinion

noted that Volpe's "approach to his section 4 (f) responsibilities...makes a joke of the 'feasible and prudent alternatives' standard and...we specifically declare it illegal."² In June, 1971, alternative routes were officially presented by the U.S. Department of Transportation, but construction of the two end segments of the expressway is near completion.

Construction of the North Expressway will destroy 124 acres of existing park and public open space (see Figure 1). San Antonio presently has approximately six acres of park per 1,000 population or 4 percent of the urban area--well below recommended levels. Brackenridge Park and Olmos Basin are accessible to large numbers of people from many parts of the city. The proposed route takes nine acres of Brackenridge and acreage from Franklin Fields, Koeler Park and Olmos Basin Park which are all dedicated public park lands. The park lands and open spaces are part of the largest contiguous park space in the central urban area and are thus totally unique.

There are also many recreational facilities involved. The San Antonio Zoo will be severely damaged because more than half of the land available for expansion will be taken by the expressway. At one point the right-of-way comes to within 19 feet of the existing animal pits. Any future expansion must take place by going beyond the expressway, which will then bisect the zoo. In addition, noise and air pollution are expected to affect zoo animals, particularly the large and outstanding bird collection.

The Olmos Picnic Area will be functionally ruined. The proposed expressway will pass through the creek bed, destroy some of the oldest and largest trees, and block off trails and rocky outcroppings. The quality of the remaining picnic area will be severely impaired due to expressway dust, noise and air pollution.

Adjacent areas will also be damaged, since a transportation corridor inevitably acts as a stimulant for economic growth along its path. Thus the adjacent land in the Olmos Basin will be subject to development pressures.

WHY PAVE THE GRASS ?

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This portion of the route and right-of-way of the North Expressway, as proposed by the Texas State Highway Department, encompasses approximately 150 acres of parkland and public open space. It extends 3.6 miles through parks, open spaces, campus lands, and zoo property.

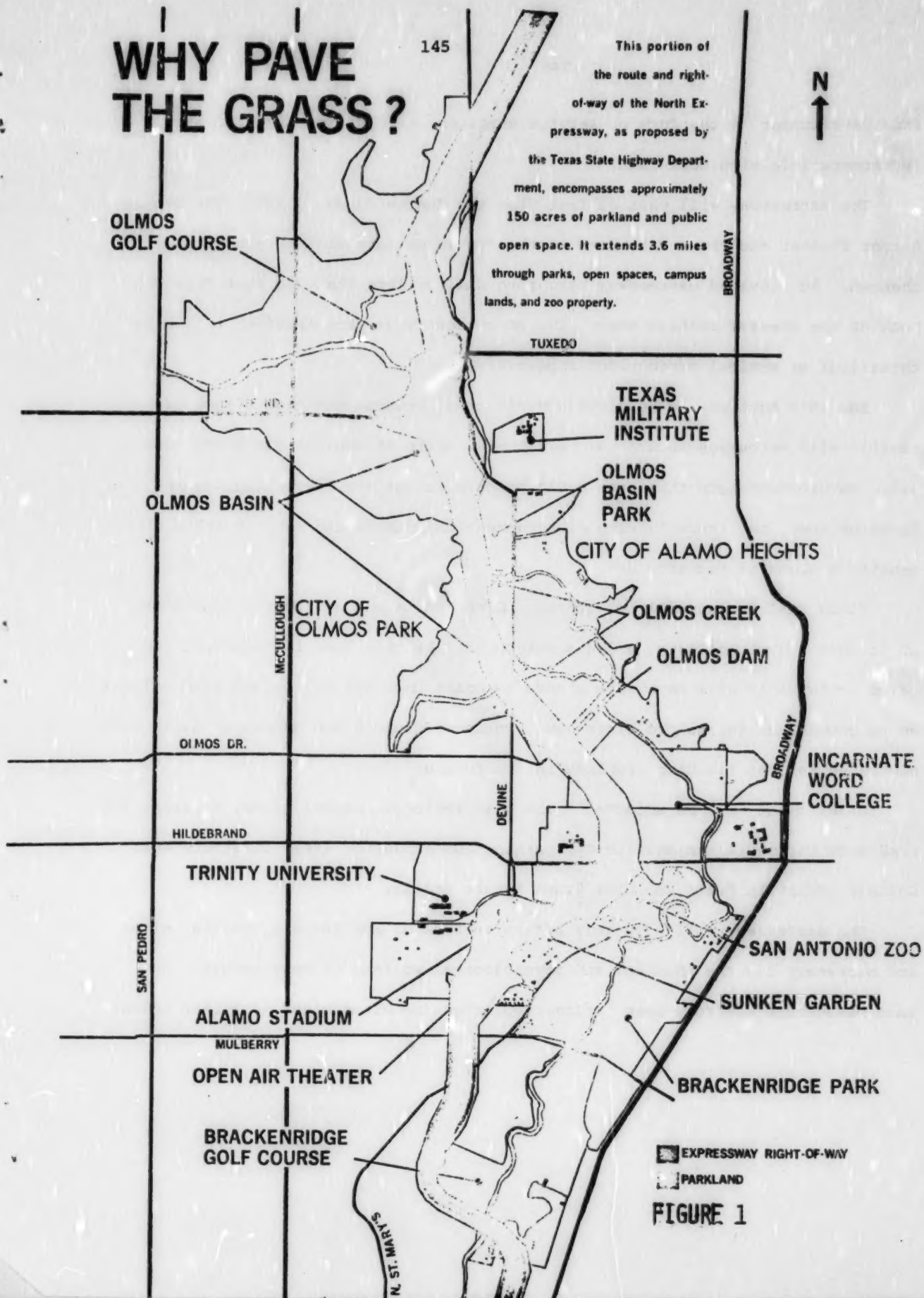


FIGURE 1

This development in the form of service stations, motels, restaurants, etc., is incompatible with park land.

The expressway will pass 65 feet from the Sunken Garden Cliff. The Sunken Garden Theater and the environment of the Sunken Gardens will be drastically changed. An elevated expressway structure will be less than 100 feet from the back of the theater seating area. The noise and fumes from traffic will make theatrical or musical productions impossible.

Edward's Aquifer may be adversely affected, because the high volume of traffic will encourage additional development north of San Antonio above Loop 410. Development into this area could jeopardize the quality of the Edwards Recharge zone, but there is much disagreement in determining exactly where the sensitive areas of recharge are.

Flood plains also will be altered. Olmos Basin and all of the land north of it form a drainage area called a watershed. As this area is developed and paved, rain water will have less chance to drain into the ground and will collect above ground and run toward Olmos Dam. Increased runoff and decreased basin area may cause serious flooding problems in the future.

Other areas will be affected. The list includes: Alpine Drive, Brackenridge Park Golf Course, Alamo Stadium-Gym parking and expansion area, Incarnate Word College, Franklin Field and Girl Scout nature trails.

The expressway will adversely affect an area of San Antonio that is unique and necessary for the physical and psychological welfare of many people. Had land management controls been implemented, these problems might have been solved.

FOOTNOTES

1. San Antonio News, July 17, 1972.
2. John W. Vardamen Jr., brief of Texas Highway Department et.al. vs. San Antonio Conservation League, April 4, 1972, before U.S. Court of Appeals, Fifth Circuit, Supreme Court, October Term 1971, 711198.

APPENDIX A

GUIDELINES FOR WRITING ENVIRONMENTAL ASSESSMENTS

Developing an environmental assessment is a formal evaluation process for determining the impacts of any proposed Federal action on the total environment. This process shall consist of thorough study of the existing environmental conditions for identifying expected and potential impacts of the proposed action. Environmental surveys and data collection should coincide with engineering analysis whereby the effects on the environment of the selected project and/or possible alternatives can be weighed objectively during the planning process.

The environmental assessment is one of the most important documents included in any management plan or grant application. It is the basis for judgment by the "responsible official" in his assessment of the proposed action, and can be entered as evidence in hearings and court actions. Therefore, it is of utmost importance that the assessment be a full disclosure document, giving the reader a clear picture of existing environmental conditions, a complete but concise description of the proposed action, and an in-depth evaluation of possible impacts, both primary and secondary, which may be either beneficial or adverse. Also, the information and data contained in the assessment is the basic information to be included in the environmental impact statement.

The environmental assessment should be prepared as a self-contained document. It may be reviewed by various readers who may never see the management plan or grant application on which it is written. The following detailed instruction, which include the significant "Five Points" as set forth in the Nation Environmental Policy Act, outline the major topics to be included in the environmental assessment.

* 1. Description of the Proposed Action

Describe the proposed action, its location, purposes, and current status (if applicable), its time setting, and interrelationship with other projects or proposals. Generally delineate the project purposes and what the plan entails. It is most important that a clear concise picture be presented in layman's language as to the type of treatment system, acreage, and length of sewer lines. Technical specifications should not be included unless they are important for understanding the project.

* 2. Existing Environmental Conditions

This section is designed to give the reader an insight as to the existing conditions in the area where the proposal is to be located. This is very important in that many readers of the assessment may not possess any knowledge as to the area in question. In many cases, inclusion of an area larger than the immediate project area (a watershed or river basin) may be necessary to prevent the possible omission of important facts critical to the overall assessment and evaluation. The following items are some of the major environmental elements which should be addressed in the assessment:

* A. Geological Elements - land forms (general topography of the area), rocks and mineral features, paleontology items (fossils), structures (faults synclines), other related elements such as soils, erosion, caves and aquifers.

B. Hydrological Elements - natural lakes, reservoirs, estuaries, rivers, springs, marshes. Other related item as turbidity, pollutants, aquifer recharge areas.

C. Climatic Elements - precipitation, temperature, freezing periods and prevailing winds.

D. Botanical Elements - trees, shrubs, aquatic plants, microflora, unique species, seasonal color, mature stands of forest, vegetative zones, and unique plant communities.

E. Zoological Elements - mammals, birds, amphibians, fish, shell fish, microfauna, migration routes, breeding areas and endangered species.

* F. Archeological/Historical/Cultural Elements - ruins, artifacts sites, ghost towns, battlefields, cemeteries, scientific areas and scenic areas.

* G. Economic Conditions/Social Relationship/Human Well-being - population trends, settlement, educational resources, employment, land values, taxation, economic trends, health aspects, aesthetics.

* H. Miscellaneous Elements - national parks or forest, wildlife refuges, contemporary human features (buildings, transportation systems, etc.), fishing and hunting clubs, parks, increased downstream water treatment cost.

* I. Programs of other Federal, State, Local and Private Individuals in the Area - highways, airports, housing developments, parks and playgrounds.

* J. Expected future activities such as population growth, industrial, and land use changes, and their impacts, without the proposed action.

3. Environmental Impact of the Proposed Action

In this section, describe the primary and secondary impacts, both beneficial and adverse, anticipated from the proposed action on the items listed in Section 2. The scope of this discussion will include both short - and long term impacts. Some examples of expected impacts are as follows:

1. Removal of present odor at an overloaded plant.
- * 2. Land use changes.
- * 3. Home and business relocation.

- * 4. Description of traffic patterns during construction.
- 5. Enhance stream uses, such as improve fishery habitat by increase DO in a given stream, reduce sludge, aquatic growth.
- 6. Air, water, noise pollution during construction and their reduction once the project is in operation.
- 7. Archeological sites which may be destroyed by construction.
- 8. Loss or altered wildlife habitat, regardless how small the area involved.

Also, identify any remedial, protective, or mitigative measures which will be taken as a part of the project to eliminate or compensate for any detrimental aspect of the project. This includes such items as plantings to hide the treatment plant, erosion control measures during construction, and alternative methods of disposal of trees, brush, and buildings which must be removed for construction of the project.

The above-listed items are but a few of the elements in which a given project may or may not induce an effect upon. It should be kept in mind that the intent of the National Environmental Policy Act is to permit the decision-maker to have all of the facts before a decision is made. Unless the writer of an environmental assessment puts such information in his report, the decision-maker will be operating on biased or limited material. The fact that a given project may involve or even destroy some element of the environment does not mean that the project should not or cannot be built. However, if the subject is not surfaced and discussed in the assessment, it could lead to possible court action, extended delays, and embarrassment to EPA, state and local interest.

4. Adverse Impacts Which Cannot be Avoided Should the Proposal be Implemented

The adverse impacts surfaced in Section 3 should be further discussed in this section. There are impacts which cannot be reduced in severity or can be reduced to an acceptable level, but not eliminated. For those which cannot be reduced, such a loss of wildlife habitat, relocation; their implications and the reasons why the action is being taken, notwithstanding their effects, shall be described in detail. Where abatement measures can reduce adverse impacts to acceptable levels, the basis for considering these levels adequate and the effectiveness and cost of the abatement measures shall be specified. An example of this could be tree and shrub plantings to hide a treatment plant, but this effort will not eliminate other impacts imposed by the project. In particular, this analysis shall detail the aesthetically or culturally valuable surroundings, human health, standards of living, or environmental goals set forth in Section 101 (b) of the National En-

vironmental Policy Act which would be sacrificed. Also, it shall describe the parties affected (including any minority communities) and any objection raised by them.

5. Alternatives to the Proposed Action

Develop, describe, and objectively weigh alternatives to any proposed action which involves significant tradeoffs among the uses of available environmental resources. The analysis shall be structured in a manner which allows comparisons of (1) Environmental and financial cost differences among equally effective alternatives, or (2) Differences in effectiveness among equally costly alternatives. Where practicable, benefits and costs should be qualified or else described qualitatively in a way which will aid in a more objective judgement of their value. Where such an analysis is prepared, it shall be appended to the statement. The analysis of different courses of action shall include alternatives capable of substantially reducing or eliminating any adverse impacts, even at the expense of reduced project objectives. The specific alternative of taking no action always must be evaluated. This analysis shall evaluate alternatives in such a manner that reviewers independently can judge their relative desirability. In addition, the reasons why the proposed action is believed by the Agency to be the best course of action shall be explained.

6. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Describe the cumulative and long-term effects of the proposed action which either significantly reduce or enhance the state of the environment for future generations. In particular, the desirability of Agency actions shall be weighed to guard against short-sighted foreclosure of future options or needs. Special attention shall be given to effects which narrow the range of beneficial uses of the environment or pose long-term risks to health or safety. Who is paying the "environmental cost" versus who is gaining the "benefits" over time shall be identified. In addition, the reasons the proposed action is believed by the Agency to be justified now, rather than reserving a long-term option for other alternatives, including no use, shall be explained.

7. Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action, Should it be Implemented

Describe the extent to which the proposed actions curtails the diversity and range of beneficial uses of the environment. Uses of renewable and non-renewable resources during the initial and continued phases of the action shall be specified. In this regard, construction and facility uses are basically irreversible since a large commitment of resources makes removal or non-use thereafter unlikely. Such primary impacts and, particularly, secondary impacts (e.g., opening areas to

further development) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the action. Any irretrievable and significant commitments of resources shall be evaluated to assure that such current consumption is justified.

8. A Discussion of Problems and Objections

In this section, the writer should briefly discuss any objections, complaints or problems which have been voiced against the proposed action. This will aid the "responsible official" in his determination as to need for an environmental impact statement.

The following general guidelines as outlined in Section 6.21 of EPA's "Procedures for Preparing Environmental Statements" will be used in evaluating the significance of the impacts of the proposed action for purposes of determining the need to develop an environmental impact statement:

1. Significant Environmental Effects

A. Although there is some latitude in defining "significant effect" on the quality of the human environment, it is mandatory that "significant effects" encompass both adverse and beneficial effects.

* B. Significant effects should include environmental consequences of both a primary and secondary nature. Primary effects (e.g., siltations during construction of waste treatment facilities) should not be given greater consideration than secondary effects (e.g., land use), which often have more far-reaching environmental consequences.

2. Individually Small, But Cumulatively Large, Actions

The total expected environmental impact of precedent setting actions and individually small, but cumulatively large, actions, shall be identified and considered fully.

3. Controversial or Nationally Significant Actions

An environmental impact statement shall be prepared and processed when an Agency action is likely to be highly controversial or nationally significant.

4. Specific Criteria

For the following specific situations on wastewater treatment facilities and water quality management plans, an impact statement shall always be prepared and processed:

A. When the project or plan is highly controversial for any reason, including the degree of treatment, method of final

waste disposal, or the location of a plant or facility. In the case of location, where controversy centers only on the disruption incident to construction and serious effort is made to restore the environs as much as possible, an impact statement is not required.

- * B. When a project or plan defaces (either by physical presence or odor) a residential development or a recognized scenic area, on either public or private lands. An impact statement shall not be required if the physical alteration is unobtrusive, or a permanent industrial facility already exists in the area and the proposed project will not constitute a commitment of substantial additional land to industrial use, providing all other effects are unobtrusive.
- * C. When a facility is to be sited on public land (or on private land in an urban area, which because of its natural beauty and wilderness state, has potential or is being considered for public park development), and the loss of aesthetics incurrent through construction and maintenance of the facility substantially reduces its value as a public park.
- * D. When the treated effluent being discharged will meet water quality standards applicable to the receiving waters, but the public is using these waters for activities that require a classification higher than their present classification.
- * E. When a project will result in a substantial displacement of population.
- F. When the environmental impact is the result of a number of projects impacting upon the same resources, as when a number of projects individually divert water from one river basin into another, or discharge effluent into the ocean instead of using the effluent to recharge the ground water aquifer.
- * G. When an existing plant is being refurbished to improve its treatment capabilities and the additions involve controversy or substantial additional impacts. However, where there is no substantial new land use, noise or odor, an impact statement shall normally not be required
- * H. When the project or plan will result in the installation of a major interceptor line that will provide service to undeveloped areas, and the effects that this will have on residential and commercial growth have not been adequately considered in the interim or final plan encompassing the project, or in the grant application and associated documents.

APPENDIX B

RESPONDENTS ON CITIZEN PARTICIPATION

ENVIRONMENTAL GROUPS

Albuquerque Wildlife and Conservation Association, G. Corry McDonald
Citizens Who Care, Mrs. Tom Martin Davis
Earth Awareness Foundation, Doris Grundy, director
Earth I Care, Andrea Flynn, sponsor
Earth I Care, John Crane
Environmental Action Council of Brazos County, D. Brooks Cofer Jr., president
Group Against Smog Pollution, Mrs. L.H. Butler, president
National Council of State Garden Clubs, Mrs. Howard S. Kittel, president
New Mexico Wilderness Study Committee, G. Corry McDonald, chairman
OCU Ecology Center, Nathaniel H. Batchelder, III
Save the Grand Canyon Committee, G. Corry McDonald
Texas Committee on Natural Resources, Edward C. Fritz, Chairman
Texas Environmental Coalition
Texas Tuberculosis and Respiratory Disease Association

PROFESSIONALS AND PROFESSIONAL ORGANIZATIONS

American Institute of Planners, North Central Texas Section, Wayne W. Snyder
City Planners Association of Texas, Ross Wilhite
Marvin Springer & Associates, Marvin R. Springer
New Mexico Institute of Chemists, Ralph B. Turner, chairman
Texas Municipal League, Mary Ann Ponder, research assistant

ACADEMIC

Richard J. Baldauf, Professor, Department of Wildlife and Fisheries Sciences, Texas A&M University
Dr. John S. Barclay, Department of Zoology, Oklahoma State University
Edward Dale Jr., Department of Botany and Bacteriology, University of Arkansas
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Sidney C. Regan, Director, Institute of Urban and Environmental Studies, Southern Methodist University.

Lee Rodgers, Chairman, Department of Regional and City Planning, University of Oklahoma

James Sciscenti, Department of Anthropology, Southern Methodist University

INDUSTRY

Atlantic Richfield Company, Interview with Seth Abbot, conservation engineer; Gordon Gallaway, Corporate Environmental Protection Division; and Ron White, environmental lawyer

Atlantic Richfield Company, C.W. Robinson Jr., Houston Refinery Manager

Lone Star Gas Company, H.R. Crawford, Manager, Engineering

Humble Oil and Refining Company, Dana W. Larson

Mobil Oil Corporation, P.F. Petrus, Manager, Environmental Affairs

Texas Forestry Association, E.R. Wagoner, Executive Vice President